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ABSTRACT

The main purpose of this self-pacing instructional module is to help preservice or inservice teachers acquire skills in designing instructional activities in elementary school science and mathematics. The format follows, generally, that of "Science - A Process Approach". Thus, there are activities which are designed to help the participant gain skill in developing pre-appraisal competency tasks, write behavioral objectives, design instructional activities for children, and design post-appraisal tasks. (BR)

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INSTRUCTIONAL DESIGN SELF PACED PROGRAM

Science-Mathematics
Module Building Group

The Research & Development Center
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THE UNIVERSITY OF TEXAS
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INSTRUCTIONAL DESIGN SELF PACED PROGRAM

Science-Mathematics
Module Building Group

David P. Butts

PRE II

Code______________

PRE-APPRAISAL COMPETENCY TASKS

II

Task I

In an in-service program two teachers did the following activity. Sitting back-to-back, so as not to see each other at work, one teacher made a construction from a packet of various-colored, various-shaped tinker toys. As she constructed, she gave her partner instructions so that the partner could reproduce the construction from a matching packet of tinker toys.

Here are a set of statements. Mark with an X the one you think best describes the purpose of the activity.

_____ A. To develop concepts of shapes: circle, cylinder, rectangle.

_____ B. To identify colors: red, green, yellow, orange, blue.

_____ C. To develop manual dexterity in constructing with pieces of wood.

_____ D. To communicate in precise terms.

_____ E. ____
(You may wish to write your own.)

Task 2

The following is a description of a learning task for teachers.

Using no measuring tools, estimate the width of this paper in cm._____

There are three types of film: 8 mm, 16 mm, and 35 mm. Mark these lines to show the width of each film.

8 mm ____

16 mm ____

35 mm ____

Advertisement is being made about the "silly millimeter" that is being added to cigarettes. Show how much longer this cylinder would be if a millimeter was added.

The relationship between the teacher's learning task above and teaching children is (mark with an X):

_____ A. Children need to become familiar with measurement.

_____ B. There is no relationship.

_____ C. Children learn to estimate in order to be able to check the reasonableness of their answers.

_____ D. Children estimate when they lack measuring tools.

Task 3

Children were given sets of 3 sealed boxes. In box A was a small round pencil, in box B was a marble, and in box C, a flat plastic disc. The children were asked to name 2 things they thought could be in each of the boxes and their observations which supported their ideas.

Following is a list of the children's behaviors. Please rate them as a, b, or c:

a = unrelated to task
b = vaguely related to task
c = directly related to task

_____ Joe intently looks at the boxes sitting on his desk and without touching them suggests they may have nothing inside.

_____ Barbara shakes the 3 boxes and notices they all make some noice.

_____ Jim reports that each box produces a different kind of sound.

_____ Jane says that the red and green boxes are Christmas packages.

_____ John states he hopes the boxes may contain peppermint sticks.

_____ Susan suggests that box A sounds as though it could be a peppermint stick.

_____ Mary points out that box A does not smell like peppermint.

_____ Ellen arranges her boxes to spell CAB.

Task 4

Place an X before any of the following instructional objectives which are acceptably stated.

_____ 1. The student will grasp the significance of the Treaty of Versailles.

_____ 2. The student will have an attitude favorable to English grammar interpreted by his response to a questionnaire.

_____ 3. The student will know six verbs.

_____ 4. The student will learn the names of the common tools in wood shop.

_____ 5. The teacher will list three major causes of the Civil War on the chalkboard.

_____ 6. The student will demonstrate the threading of a sewing machine.

_____ 7. The student will pay attention as the teacher demonstrates the use of the lathe.

_____ 8. The student will develop a sense of the cultural unity of man.

_____ 9. The student will name and describe the themes of four of Shelley's poems.

_____ 10. The student will develop interest in leisure sports.

Task 5

Read the instructional activity described below:

> Show the children some shapes. Ask them to identify those which are symmetrical and those which are nonsymmetrical. Ask several children to demonstrate where the shapes might be folded to show their symmetry.
>
> Ask the children to name those shapes which are symmetrical with respect to more than one line and to demonstrate this symmetry by folding.

Write the action words used above to describe student behavior.

____

____

____

Task 6

Mark each objective A as adequate or I as inadequate.

_____ After carrying out these activities the child should be able to construct a classification of a set of objects into two or more groups based on the usage of the objects.

_____ At the end of these activities, the student will be able to describe common objects.

_____ After this lesson the child will be able to identify a fraction while working at his desk.

_____ After these activities the pupil will be able to construct an operational definition without help from other pupils or teacher.

_____ At the completion of this lesson the pupil will be able to construct a pyramid.

Describe your basis for distinguishing adequate from inadequate objectives.

____

____

Task 7

The characteristics of a behavioral objective are:

A.____

B.____

C.____

Task 8

Order the following set of objectives &by numbering 1, 2, 3) according to the complexity of the objective--from simplest to most complex.

_____ Demonstrate a way to find the volume of 3 jars, using standard metric units.

_____ Identify jars which are of equal or unequal volume, by comparing how much water they can hold.

_____ Order three or more jars, largest to smallest, by using one jar to measure how much water the other jars will hold.

Task 9 A

Below is an instructional objective and a set of skills. Code each skill as:

a = prerequisite skill necessary for child to achieve the objective
b = skill relates to objective but not prerequisite.
c = skill not related to objective

At the end of this activity the child will be able to construct a bar graph.

(SAPA, B-p)

_____ The child can name the units along the vertical and horizontal axes of a bar graph.

_____ The child can tell how many pets there are in Mrs. M's room by using a bar graph.

_____ The child can tell why Mrs. M's class had so many pets.

_____ The child can distinguish between a bar graph and a line graph.

Task 9 B

Below is an instructional activity and a set of skills. Code each skill as:

a = prerequisite skill for child to succeed with activity
b = skill relates to activity but not prerequisite
c = skill not related to activity

The teacher placed an elongated cylinder on a projector and rotated the cylinder (which could not be seen) so that two differently shaped shadows were projected. The teacher asked what the names of the shadows were, and what the class thought the name of the object on the projector was.

(SAPA, B-q)

_____ The child can draw a picture of the two-dimensional shapes that the teacher names.

_____ The child can name three-dimensional shapes when shown the object.

_____ The child can draw the shadows that three-dimensional shapes cast.

_____ The child can order various sized triangles or rectangles.

Task 10

The following is an instructional activity for children:

> Give the children a geometric shape such as a simple pyramid, a cone, or a hemisphere. Ask them to draw on paper the two shadows they would expect. Then put the object in the shadow box, and compare the shadows with the drawings. Try to get the children to identify the two-dimensional shadows of this regular geometric shape.

State two performance objectives of the instructional activity given above.

At the end of this activity the child should be able to

1. ____

____

2. ____

____

Task 11

Below are 2 sets of an objective and possible student activities. Rate each activity as:

a = irrelevant to objective
b = possibly related to objective
c = demonstrates behavior described in objective

Objective:

At the end of this activity, the child will be able to name the principal colors: red, yellow, blue.

_____ Have the child pick up all the blue objects in a set.

_____ Have the child tell the color of his shirt (it is blue, or use other blue article).

_____ Have the child spell the word red on a spelling test.

_____ Have the child match a strip of red paper to all red objects in the room.

Objective:

At the end of this activity the child will be able to identify and name fractional parts of a unit, using decimal notation for tenths.

_____ Give the child 10 paper clips and ask him to separate them in two piles and write a numeral representing the decimal part of the paper clips in each pile.

_____ Ask the child how many tenths there are in a dollar.

_____ Ask the child to measure the long edge of a paper to the nearest tenth of a meter and record his measurement.

_____ Ask the child which is greater 1/4 or 1/3.

Task 12

The following are objectives of a science lesson:

1. At the end of the activity the child will be able to identify and name variations among objects and organisms which may have many features in common.

2. At the end of the activity the child will be able to describe features which are common for each member of a group.

Rate each of the following student activities:

a = irrelevant to objective
b = instructional experience using real objects
c = instructional experience using likenesses of real objects

_____ Ask the child to identify and state the similarities and differences in his potatoes which differ in size, shape, color, and skin texture.

_____ Give each child 10 peanuts and ask them to find as many ways as they can in which one peanut is different from another.

_____ Ask the child to describe the differences found in a collection of insects.

_____ Ask children to describe differences found in insects, using enlarged pictures.

_____ Ask children to paint a water color picture of their favorite insect.

_____ Ask children to divide 10 leaves into two groups.

Task 13

Select one objective (and indicate your choice by underlining) and write an appraisal item, appropriate for the objective, which could be used with a class of children.

Grades 1 & 2:	At the end of this activity the child will be able to describe common environmental objects, such as animals, in terms of two- and three-dimensional shapes.

Grades 3 & 4:	At the end of this activity the child will be able to distinguish whether or not two objects dropped from the same height and at the same time strike the floor at about the same time.

Grades 5 & 6:	At the end of this activity the child will be able to apply a rule for finding the distance a wheel rolls given the circumference of the wheel and the number of rotations it makes.

Appraisal item: ____

____

____

____

____

Task 14

Following are three sets of objectives and appraisal tasks. Select one (indicate by underlining) and describe what you would say or do to involve the child with this task.

Grades 1 & 2:

Objective: At the end of this activity the child will be able to order containers by volume, when ordering is not obvious by inspection, by pouring liquid or a finely divided solid (such as sand) from one container to another.

Appraisal Task: Bring in (or have the children bring in) a collection of boxes of various sizes and shapes--shoe boxes, oatmeal boxes, boxes from dry cereal, and so on. Also have about ten identical, small unit-volume boxes or fruit cans, as well as sand or other materials to pour.

Grades 3 & 4:

Objective: At the end of this activity the child will be able to describe observations that can be used to test inferences about the displacement of water by air.

Appraisal Task: Fill a wide-mouth transparent bottle about half full of colored water. Insert a kitchen baster about halfway into the water. Slowly squeeze the bulb and release it.

Grades 5 & 6:

Objective: At the end of this activity the child will be able to demonstrate that in some materials, a liquid moves upward faster than it does in others.

Appraisal Task: Joe has been given two pieces of cloth.

Task 15

Following is a set of objectives and a brief description of the topic of an exercise.

Objective:	At the end of this activity the child will be able to identify the kinds of locomotion possible in animals of various shapes and with various kinds of appendages. At the end of this activity the child will be able to demonstrate the characteristic "push" common to animals that walk or crawl.
Activity:	An animal propels itself forward in a horizontal direction by pushing back against its surroundings. An animal on the land must push back against the earth or the object it stands on; a swimming animal must push back against the water; and a flying animal must push back against the air. The shape of the animal's body and appendages affects its pattern of movement.

Rate each of the following initiating activities of the teacher:

a = unrelated to objectives
b = related to objectives, high teacher control
c = related to objectives, high student control

The teacher says...

____ "Watch the turtle and notice how he pulls his head inside his shell when frightened."

____ "Watch the turtle and notice how it moves."

____ "Watch the turtle and tell me about it."

____ "Watch the turtle and be ready to ask a question."

____ "Watch the turtle pushing through the sand and be ready to tell me how it does this."

____ "Watch the turtle and describe the patterns of design on its shell."

Task 16

Below is a set of objectives and a brief description of the topic of an exercise for 4th or 5th grade children:

Objective: At the end of this activity the child will be able to state that the representation of an object--for example, the picture of an animal--is not always life-size.

At the end of this activity the child will be able to state the relationship between the actual size of an animal and its representation when the scale is given.

At the end of this activity the child will be able to demonstrate the procedure of indicating scale by drawing a line segment to represent a specific length.

Topic Description: Children learn to accept representations of animals and objects as substitutes for the actual animals and objects.

Many of the pictures they see or study are not life-size. The portrayal is either smaller or larger--a fact that is seldom pointed out to children. The assumption is that they can visualize the object in its correct size. The purpose of this exercise is to help children appreciate the usefulness of scaling, in visualizing an object in its correct size.

Rate the following bonus or extension activities, for those who have finished ahead of others, as

a = unrelated to objectives
b = related to objective and probably feasible
c = related to objectives but probably requires many prerequisite skills and not feasible

_____ Give the child a small turtle and a picture three times larger of it and ask him to determine the scale.

_____ Give the child a meter stick and ask him to make a scale drawing of the classroom, containing his desk and the teacher's desk, also to scale.

_____ Ask the child to give a brief explanation of the purpose of scales, contrasting the need for a scale on a 5 cm drawing of a gazelle and a 5 cm drawing of a house cat.

Task 17

When given clay models of a cow and an elephant, children made the following responses in a lesson which has the following objective:

> At the end of this activity the child will be able to construct a classification of animals (given models) using the senses as the only source of information.

Rate the responses as:

a = unacceptable
b = acceptable, if child can clarify
c = acceptable

_____ The cow and the elephant are grouped together because they both eat grass.

_____ The cow and the elephant are grouped together because they both have projections on their head.

_____ The cow and elephant are grouped together because they both bear their offspring alive.

_____ The cow and elephant are grouped together because they both have tails.

Task 18

A	B	C	D
XX XX	X X X	XX XX	X X
XX XX			X X
	X X X	XX XX	X X
XX XX			X X
XX XX	X X X	XX XX	X X
	X X X		X X
		XX XX	X X X
Groups of 4 students	Individual students in rows	Pairs of students	U-shaped arrangement

Above are four room arrangements. Place the letter of the arrangement which best fits each instructional activity.

_____ Children are asked to draw the non-living parts of their classroom aquarium, then to draw the living things that have fins in the aquarium.

_____ Each group of children has a container, a seltzer tablet, a thermometer, a stop watch, and graph paper. To determine the relationship between seltzer dissolving time and temperature of water, water must be secured, the temperature taken, the tablet dropped, the watch started, the tablet observed, the watch stopped, and time recorded.

_____ After each child gives his report, ask the other children if they think the report should be changed. With the children's help, develop an outline (on the chalkboard or on a large chart) that summarizes the elements of a good report of an investigation.

Task 19

Your science class has 30 minute daily periods and you plan to begin an exercise on Tuesday. On what days would you teach the following activities?

ACTIVITY DAY

Pre-Appraisal:

Put potatoes differing in size, shape, color, and skin texture on the demonstration table. Ask the children to identify and state the differences. Ask them to state characteristics common to all the potatoes.

Activity 1:

Begin the activity by having the children review the differences between dogs and cats. Encourage a discussion of size, shape, color, "looks," and other descriptive features. Then ask, Do all dogs look alike? Ask the children to compare the pictures of dogs which they have brought to class, and to then describe the differences among the many varieties. Do the same with the pictures of cats.

Activity II:

Bring a large bag of peanuts in the shell to class, enough so that every child has 8-10 peanuts. Tell the children to examine them. Ask, Are they all peanuts? Are they all the same? Then ask them to find as many ways as they can in which one peanut is different from another.

Activity III:

Arrange eight or more balls (sphercial objects) on the table, and ask the children to describe how they are different.

Activity IV:

Ask the children to compare specimens and observe the differences among leaves of the same species--for example, one kind of maple, one kind of sycamore, or one kind of oak.

Activity V:

Put on the demonstration table samples of different sizes and shapes of the many types of paper used in the classroom. Ask the children for a name for all the material. Then ask them to describe the differences they observe.

Post-Appraisal:

Put a penny, a dime, and a half-dollar in front of the child. Say, Name one way in which two of the coins are alike and one way in which those two differ from the third. Say, Name two ways in which all three coins are alike.

Put four pieces of celery (including the leaves) that vary in length and color in front of the child. Say, Name two ways in which these pieces differ from one another. Say, Name two ways in which these pieces are alike.

Task 20

Here is a lesson plan. Rate each part as

a = adequate
b = needs clarification
c = inadequate

PLAN A

Part of Plan	Rating
I. Objective At the end of this lesson, the child will be able to distinguish between certain food tastes as similar to, or different from, each other.	
II. Pre-Appraisal Put a bottle of diluted cider vinegar, a dish of salted nuts, and some sour lemon drops on a table. Let the children taste as many of these as they wish.	
III. Activity Give each child a quarter of a slice of bland fresh bread (the less tasty the better!) on a paper napkin. Tell the children to break off a piece of the bread and eat it.	
IV. Evaluation On a table in front of the child, put some bits of sweet chocolate, some salted nuts, and two wide-mouthed jars, one containing a sugar solution and one containing some diluted white vinegar. Give the child a paste stick, indicate the sugar solution, and say: Dip the stick into this jar and taste the liquid. Now taste the chocolate and the nut. Which is like the liquid you have tasted? How are they alike?	

(Task 20 continued on
next page)

Task 20 (continued)

PLAN B

Part of Plan	Rating
I. Objective At the end of this lesson the child will be able to name the ordered number pair that locates a position on a graph or a grid.	
II. Pre-Appraisal Ask each child to write two numbers to describe the exact location of a point on a graph.	
III. Activity Working in pairs, one child writes any ordered number pair. Suppose, for example, that he writes (7,6). Another child marks that location on a grid. He should trace across the x-axis to 7 and then up that line (x=7) to the intersection with the point on the y-line (y=6). Then he should mark the intersection of these two lines with a large dot.	
IV. Evaluation Give each child a copy of a grid and these instructions: Put a Q at the point of intersection of the line crossing the x-axis at 1 and the line crossing the y-axis at 3.	

Task 21

Based on the following objective, a teacher planned several activities. Rate the activities as:

a = not related to objective
b = teacher dominates or controls the action by limiting the possibilities of response to one or two answers
c = student dominates or controls the action because of an open question or task.

Objective: At the end of this activity the child will be able to construct an inference about conductors and nonconductors.

_____ The teacher gave a brief lecture on the flow of electrons.

_____ The children suggested a test which they could make to determine whether or not a material was a good conductor of heat.

_____ In a corner of the room the teacher placed a quiz board, concerned with conductors, which the children were free to work on independently.

_____ The teacher selected a glass rod and aluminum rod of the same shape and held them in a flame, asking the children what they thought would happen.

Task 22

Here is an objective and description of a classroom activity:

Objective: At the end of this activity the child will be able to construct inferences based on observations of an animal's tracks or traces and its characteristics or environment.

Activity: Put up a large color poster of a woodland scene where all the children can see it. Give each child a hazelnut, walnut, pecan, or almond nut, all of which have shells that are difficult to open with just the fingers. After the children have had an opportunity to make observations about the nuts, such as their texture, shape, hardness, and color, have them look at their pictures of the woodland scene again. Ask whether anything about the nuts in their pictures is different from the real nuts they have been observing. Direct attention particularly to the acorns that are broken.

"What do you infer about an animal that is able to crack a nut?"

Write two acceptable student responses:

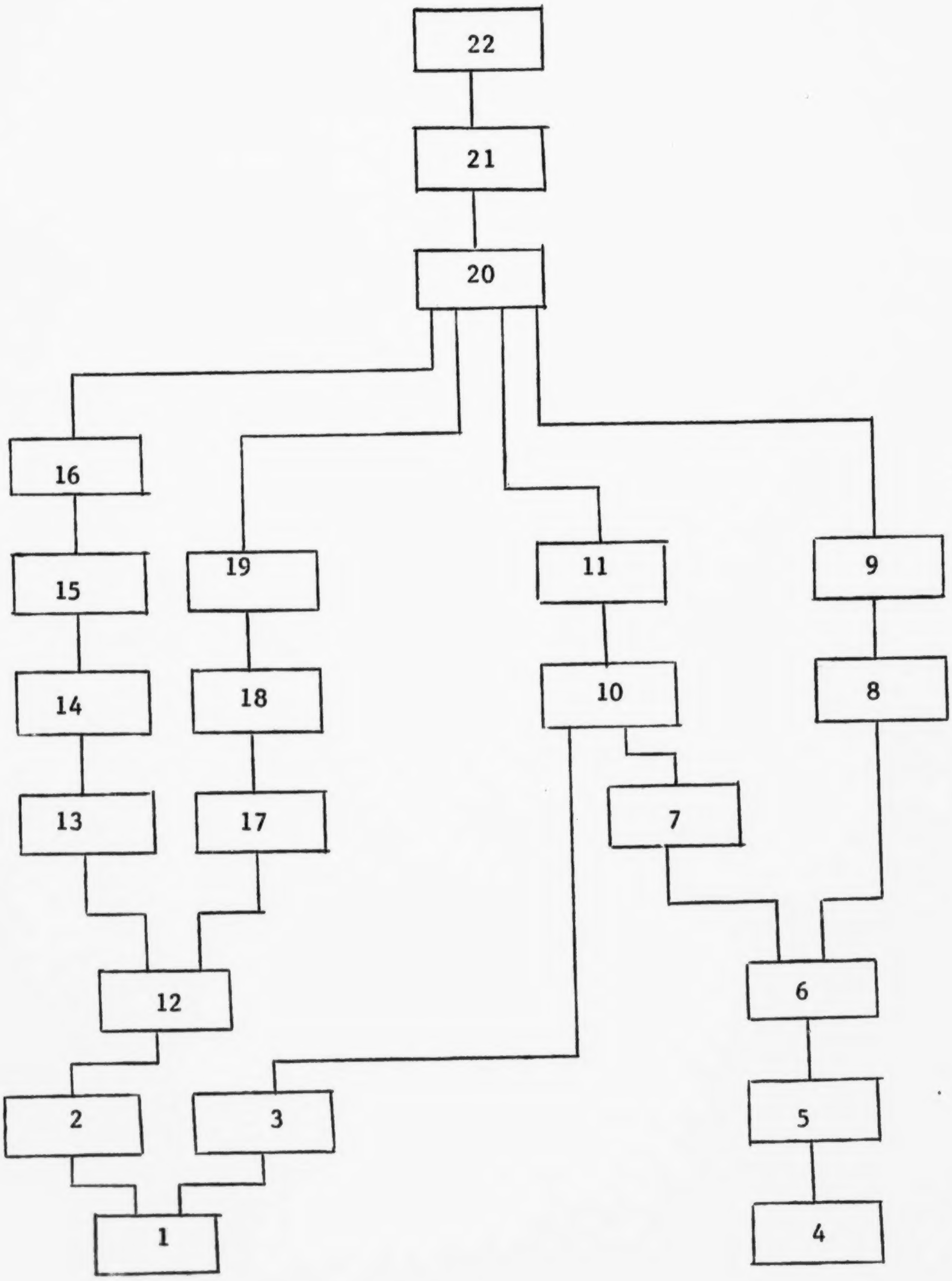
____

____

And write two unacceptable student responses:

____

____



PROFILE FOR

INSTRUCTIONAL DESIGN SEQUENCE

INSTRUCTIONAL DESIGN OBJECTIVES

1. When completed with a task, identify the key idea of the task.

2. State the relationship between the task and instruction for children.

3. Identify the individual behaviors or responses which are related to a total task.

4. Distinguish between a behaviorally stated instructional objective and a non-behaviorally stated objective.

5. Identify an action word appropriate to a given behavior.

6. Distinghish from a list of behaviorally stated objectives those which are adequate from those which are inadequate in regard to context description.

7. Name the characteristics of a behavioral objective.

8. Order a set of behavioral objectives according to complexity.

9A. Given the instructional objective, identify prerequisite and related skills.

9B. Given the instructional activity, identify prerequisite and related skills.

10. Construct an adequate behavioral objective appropriate to a given instructional activity.

11. Identify at least two situations (appraisal tasks) in which children will demonstrate the behavior described in the objective.

12. From a set of alternative instructional activities, identify those which can be used to help children acquire desired behaviors.

13. Construct an assessment item for a given behavioral objective.

14. Describe how to present an appraisal task to a child.

15. Identify and construct two alternative means for initiating instruction.

16. Identify and construct supplemental materials for those children who are to continue the study initiated in the instruction.

17. Identify acceptable student responses to appraisal tasks.

18. Describe room materials and children arrangement to fit an instructional plan.

19. Identify an appropriate time management plan for an instructional sequence.

20. Construct an instructional plan including Pre-Post Appraisal, instructional activities, room arrangement, materials access and anticipated time management.

21. Describe questions or verbal tasks the teacher might use which are consistent with the objectives.

22. Identify and describe children's responses possible for three teacher questions or verbal tasks.

23. Describe modifications of an instructional plan based on child's performance on pre-appraisal.

24. Describe modifications on an instructional plan based on children's non-acquisition of desired behavior.

25. Describe modifications of an instructional plan based on lack of materials or the individual preference of teacher.

INSTRUCTIONAL DESIGN TASK #1

Task Objective

When completed with a task, identify the key idea of that task.

Task Focus

In a methods course, two students were measuring each other head-to-toe and fingertip-to-fingertip with a meter stick.

Here are a set of statements. Mark with an X the one you think best describes the purpose of the activity described above.

_____ A. To understand the metric system.

_____ B. To practice measuring with a meter stick.

_____ C. To develop the concept of measure.

_____ D. To find an individual's height using metric measure.

_____ E. ____

(You may wish to write your own.) To check your answer, turn to p. 5.

Task Activity

Here is a short task for you to do.

When he returned from his vacation of two weeks, Mr. B. observed several things about his yard.

A. The grass was a brown color in many places.

B. The leaves of the grass appeared to be folded up.

C. There were large cracks in the soil.

Write three inferences that might explain Mr. B.'s observations.

1.

2.

3.

Give the letter of the observations upon which your inferences were based.

1.

2.

3.

(The answers to this task you will find on the next page.)

The main idea of purpose of this task is: (Mark with an X)

_____ 1. To give you something useful to do.

_____ 2. To illustrate the difference between observation and inference.

_____ 3. To help you predict what Mr. B. will do next in his yard.

_____ 4. To illustrate the alternative inferences that can be made from the same set of observations.

Discussion of Your Answer

In your answers, # 1 might be plausable, and yet that really is not the main purpose. Likewise # 3 can be eliminated as a possible choice. When you carefully examine # 2 and # 4, which do you think is the best description of the reason for doing that task? Since the task requires you to make three inferences and identify observations which support them, # 4 is the best answer.

NOTE: The answers to the tasks were:

Inference 1. The neighbor hadn't watered the yard. (B, C)

Inference 2. The weather had been hot and very dry during the past two weeks. (A,C)

Inference 3. A disease had invaded his yard. (A, B)

You may have had others--but, they should be explanations or reasons for the observations.

Here is a description of another task.

In a room there were two jars. I observed the following:

1. The jar at the front of the room has a higher water level than the jar on the window sill.
2. There was a puddle of water on the window sill near the jar.
3. There was a trail of wet spots on the floor, leading from the door to the jar at the front of the room.
4. Earlier in the day, the window was open near the jar on the window sill.

Based on the observations listed above, write three inferences that explain or account for the different levels of water in the two jars.

Inference A____

____

Which 2 observations support your inference A: 1 2 3 4 (circle)

Inference B____

____

Which 2 observations support inference B: 1 2 3 4 (Circle)

Inference C____

____

Which 2 observations support inference C: 1 2 3 4 (Circle)

What is the main purpose of this task?

____

____

Based on the task, justify your answer.

Discussion of Your Answer

The main purpose of this task is to construct inferences from a set of observations and to identify which observations support that inference. This is justified by the fact that the task requires the individual to both make inferences and then identify the observations which support them.

You are now ready for the Competency Appraisal. After you have completed it, please have it scored by your instructor.

Discussion of Task Focus

Your answer should have been B or a statement similar to it. The task was to practice measuring. While the individual might understand more about the concept of measure and the metric system, this task provides an opportunity to use a meter stick. Had the purpose been to find height, then the fingertip measurement would have been unnecessary.

COMPETENCY APPRAISAL

In an in-service program two teachers did the following activity. Sitting back-to-back, so as not to see each other at work, one teacher made a construction from a packet of various-colored, various-shaped tinker toys. As she constructed, she gave her partner instructions so that the partner could reproduce the construction from a matching packet of tinker toys.

Here are a set of statements. Mark with an X the one you think best describes the purpose of the activity.

_____ A. To demonstrate symmetry of design in a three-dimensional arrangement of shapes.

_____ B. To demonstrate concise and accurate descriptions of objects.

_____ C. To develop audio-manual perception.

_____ D. To construct esthetic color arrangements.

_____ E. ____

(You may wish to write your own.)

INSTRUCTIONAL DESIGN # 2

Task Objective

State the relationship between the task and instruction for children.

Task Focus

The following is a description of a learning task for teachers.

After watching a brief science experiment on an 8 mm film loop, the teachers wrote two statements of observation and two statements of inferences.

The relationship between the learning task for teachers and teaching children is: (Please mark with an X)

_____ A. Children need to become familiar with 8 mm film loops.

_____ B. There is no relationship.

_____ C. Children need to be able to construct statements of observation and inference about events.

_____ D. Children need to be able to use information from experiments on film which cannot conveniently be done in the classroom.

See page 6 for Task Discussion

Task Activity

Here are the descriptions of two activities that you have already done. After each description is a set of statements. Select which statement you think best describes the main idea of the activity as it relates to teaching children and mark with an X.

In the materials, you will find two Packet C's. Place yourself with your back to your partner. Both of you should take out all of the tinkertoys in Packet C. Without looking at your partner, construct an arrangement of four of the tinkertoys and describe what you did so that your partner can make the same kind of arrangement.

You may find it useful (and fun) to repeat this two or three times.

Did you experience any difficulties?

What were they?

What did you do to improve your descriptions?

_____ A. Children enjoy tinkertoys in creative expression.

_____ B. Children need to learn that specific and precise verbal communication is essential in science.

_____ C. Children need practice in using the names of shapes in this experience.

See page 4 for acceptable response.

Using the three boxes, name two things that you think could be in each of the three boxes.

Box A	Box B	Box C
1.	1.	1.
2.	2.	2.

For one of the things that you named in each of the boxes, list four observations that support that inference.

Inference	Observations
A. ____________________	1. 2. 3. 4.
B. ____________________	1. 2. 3. 4.
C. ____________________	1. 2. 3. 4.

_____ A. Children need to know that much of the time, scientists are really guessing; like guessing what is in the black box.

_____ B. Children like to work with a puzzle or mystery situations.

_____ C. Children need to distinguish between what they observe and what they infer.

_____ D. Children need to specify what observations support their inferences.

Discussion of Your Answer

In the first set of activities, you probably remember that what it required of you was the need to be very precise in the directions you gave in order for your partner to be able to reproduce your creation. It is important for children to have opportunities to be creative--and to practice their vocabulary about shapes--however, this activity is directed primarily at the skill described in statement B.

Handling the mystery boxes was fun, and in some ways it is much like a scientist as he investigates many unknowns. But in this case, the activities required you to both infer and to specify your observations. The best statement is D which incidently involves C doesn't it?

Let's try another activity you have done.

Look for the pictures of farm animals on display in this room. Individually you and your partner make a list of the things that have a gizmo on top of one of their ends.

1.
2.
3.
4.

Do your lists agree?

Why?

Now identify each animal that has a cone-shaped projection on its head.

1.
2.
3.
4.

Do your lists agree this time?

Why?

What was the difference in the "Gizmo" task and the "Cone-shaped projection" task?

What is the key idea you learned when you did this?

Do you teach any of this to children?

What?

Discussion of Your Answer

In this case, the activity emphasizes the need for specific descriptive language. You were not certain what a gizmo was, but both you and your partner understood a "cone-shaped projection". Good communication requires that both you and your partner understand and are using the same language. Using two- and three-dimensional shapes to describe objects is a powerful tool, both for you and for children. Possibly you included two ideas for children; that is, using shapes to describe objects, and carefulness in describing so that the other person knows what you are referring to.

Let's try another.

Take out the objects in Packet D. How many of them have a shape

a. like a circle?____________
b. like a triangle?____________
c. like a square?____________
d. like an ellipse?____________
e. like a rectangle?____________

Suppose you were to communicate these results to someone who could not hear or read words. How might a graph help?

What information or story should the graph tell?

What information must be on the graph?

In this activity, what was the purpose of it for you as an adult?

Should children also be able to do this?

For what reason?

You are now ready for the Competency Appraisal. When you have completed it, please have it scored by your instructor.

Discussion of Your Answer

This activity provides an opportunity to communicate information via a graph. Being able to organize data and to present it in a graph is an important skill for both adults and children. To do this children must learn what kinds of information are required of a graph and the conventions which suggest how to do it.

You are now ready for the Competency Appraisal. When you have completed it, please have it scored by your instructor.

Discussion of Task Focus

When teachers are involved in learning tasks, there should be a specific purpose for that task related to the instruction of children. In the task described, that which the teachers did (construct statements of observations and inferences) illustrate the connection. Your answer should have been C. If the situation had been structured in a different way, it could have been A or D. However, for this to be true, what the teachers did with the task would also have to be quite different.

COMPETENCY APPRAISAL

The following is a description of a learning task for teachers:

Use no measuring tools for these tasks.

Estimate the width of this paper in cm.______________

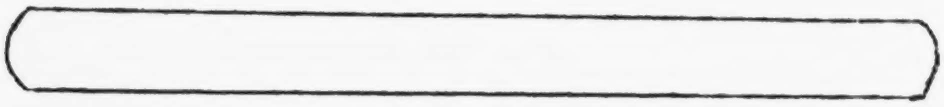
There are three types of film: 8 mm, 16 mm, and 35 mm. Mark these lines to show the width of each film.

8 mm ____

16 mm ____

35 mm ____

Advertisement is being made about the "silly millimeter" that is being added to cigarettes. Show how much longer this cylinder would be if a millimeter was added.



The relationship between the teacher's learning task above and teaching children is (mark with an X):

_____ A. Estimating aids children in determining gross measurements.

_____ B. The metric system will likely be adopted by Congress as the standard system of units for measuring.

_____ C. There is no relationship.

_____ D. To be able to estimate is one of the skills expected of elementary school children.

INSTRUCTIONAL DESIGN TASK # 3

Task Objective

Identify individual behaviors or responses which are related to a task.

Task Focus

The second grade children were discussing the weather chart. They had been recording weather conditions such as temperature, wind, cloud cover, and moisture. The teacher then asked them to compare the weather record for today with the same day one week earlier.
(SAPA, B-G)

The following is a list of children's responses. Please rate them as:

a = unrelated to task

b = vaguely related to task

c.= directly related to task.

_____ 1. Joe says that he had fun at his grandmother's a week ago.

_____ 2. Jerry says that it is warmer today than it was a week ago.

_____ 3. Jane says she likes warm weather better.

_____ 4. John says that it usually rains when it is cloudy.

_____ 5. Jim says that the cloud cover was about the same last week as today.

_____ 6. Janet says that it is breezy today.

See page 5 for Discussion of Task Focus

Task Activities

In a third grade class, the teacher had a small aquarium in which there was a green turtle. She asked each child to draw a picture of the turtle that was as near like the real turtle as possible.

(SAPA, C-p)

Which of these skills did this task require of the children?

(Mark with an X)

_____ 1. To identify which color to use.

_____ 2. To know what kind of food the turtle preferred.

_____ 3. To measure the aquarium's volume..

_____ 4. To measure the length of the turtle.

_____ 5. To observe the moving parts of the turtle.

_____ 6. To find out how much of the aquarium the teacher wanted in the picture.

_____ 7. To decide how big to make the turtle.

Discussion of Your Answer

If you look back to the teacher's request, "Draw a picture of the turtle as near like the real turtle as possible". Items # 1, 4, 5, and 7 are those things which the children must be able to do in order to be successful. Item # 6 is interesting, but not really included in the initial request, and items # 2, and 3 are quite unrelated to the instructional task.

Here is another episode.

A first grade teacher placed a series of pictures of animals on the bulletin board. She then asked the children to find shapes like circles, triangles, spheres, and cones in the animals.

SAPA, B-C

Which of these skills did this task require of children? (Mark with an X)

_____ 1. Able to identify shapes like circles and triangles.

_____ 2. Able to identify shapes like cones and spheres.

_____ 3. Able to visualize a three-dimensional shape and a two-dimensional picture.

_____ 4. Able to name common shapes: cones, spheres, circles, and triangle.

_____ 5. Able to distinguish between something shaped like a circle, but not really exactly a cricle, and a region named a circle.

Discussion of Your Answer

To be successful with this task which the teacher has posed, the child must have all of the five skills listed. The task requires much of a child's ability to identify and use shapes in describing animals.

Here is another activity.

During a two week period a first grade teacher had an aquarium in the classroom for the children to observe and informally discuss. She then asked the children three questions.

A. What is on the botton of the aquarium?
B. What makes the water green?
C. What is the black stuff in the bottom of the acquarium?

(SCIS--Organisms)

What skills do you think the child must have in order to be successful with the task?

For question A he must:

1.____

2.____

For question B he must:

1.____

2.____

For question C he must:

1.____

2.____

Discussion of Your Answer

In your answer to question A, you probably included that the child must both identify and name objects on the bottom of the aquarium; for example, sand and gravel.

Question B requires that the child inferred the presence of algae. To be able to do this he must have observed that it was not there at the beginning of the aquarium observation and possibly some of the conditions, sunlight, temperature, etc., which would encourage its growth.

Question C suggests that the child first had observed the detrius in the bottom of the aquarium, and that it wasn't there when the aquarium was first started. He may have seen particles dropped by the fish, but that really isn't likely. He will have to infer that this is waste material or dead or undesired stuff from the living organisms in the aquarium.

How do you now feel about searching through a task to find what responses are being required of children?

You are now ready for the Competency Appraisal. Please have it scored by your instructor when you are finished.

Discussion of Task Focus

The question which the teacher had asked was "Compare the weather record for today with the same day one week earlier."

Joe is responding but his resonse is more asking for attention rather than focused on the request of the teacher. It really should be rated an A.

Jerry described a comparison of the temperature--a response which should be rated C.

Jane is discussing one of the factors that they had been observing in weather, and her response really contains a comparison--but of what she likes rather than what they observed. Many will rate her response an A, and a few will say that it is almost a B.

Because John's answer indicates that he is putting some observations together--and doing some inferring--many will think he is on target. But what was the task? Did his answer indicate a comparison of today with a week ago? Since the actual chart isn't given, you don't know if it was both cloudy and rainy on both days. John's response needs a teacher to ask him to tell more in order to find out what point he is really trying to make. Probably it should be rated a B.

Jim is right on target. Rate him a C.

Janet is accurate--but has she done what was requested? She should be rated a B.

COMPETENCY APPRAISAL

Children were given sets of 3 sealed boxes. In box A was a small round dowel, in box B was a marble, and in box C, a flat plastic disc. The children were asked to name 2 things they thought could be in each of the 3 boxes and their observations which supported their ideas.

Following is a list of the children's behaviors. Please rate each one as a, b, or c:

a = unrelated to task
b = vaguely related to task
c = directly related to task

_____ John says that box A's object is metal because it is heavier than the other two boxes.

_____ Mary weighs each box on the equal arm balance and orders the boxes according to weight.

_____ Jimmy states that he prefers box C.

_____ Sylvia identifies box B as having something rolling freely inside.

_____ Ellen suggests that box A also has something rolling inside.

_____ Joanne tells the class that all 3 boxes are her favorite color--blue.

_____ Davey says that he thinks Box B has a blue object.

INSTRUCTIONAL DESIGN TASK # 8

Task Objective

Order a set of behavioral objectives according to complexity.

Task Focus

Order the following set of objectives (by numbering 1, 2, 3) according to the complexity of the objective--from simplest to most complex, with #1 being the simplest.

_____ A. Identify and name the two-dimensional shapes that are components of regular three-dimensional shapes.
_____ B. Identify the following three-dimensional shapes: sphere, cone, cube, cylinder and pyramid.
_____ C. Construct and name the following two-dimensional shapes: triangle, circle, square, rectangle and ellipse.
(SAPA, A-O)

See page 3 for answers.

Task Activities

Here are three objectives. First, describe what you think is their correct order, and second state the reason for your choice.

1. Demonstrate the use of a chart to record weather conditions.
2. Distinguish between changes in weather conditions on two days given two weather chart recordings.
3. Demonstrate a procedure for finding the temperature.

(SAPA, B-G)

The correct order would be:

3	1	1	2	3
2	3	2	1	1
1 ,	2 ,	3 ,	3 ,	2

The reason for my choice is:

Discussion of Your Answer

If you selected 3--1--2 you are correct. Your reason should have included the idea that task # 1 depends in part on task # 3, and task # 2 depends quire definitely on task # 1.

Ready to try another?

Describe what you think the correct order is, and state the reason for your choice.

1. Describe the join process by writing number sentences such as "2 + 5 = 7"
2. Name the written symbol "=" as "is another name for" or "equals".
3. Demonstrate a procedure for finding the sum of any two whole numbers, the sum of which does not exceed ninety-nine.

(SAPA, B-r)

Your order is:	3	1	1	2	3
	2	3	2	1	1
	1	2	3	3	2

Your reason for the order is:

Discussion of YOur Answer

In this case your order should be based on which task depends on another. Since task # 2 does not depend upon either # 1 or # 3 it would be at the base of your order. Task # 3 requires that a child be able to do # 1, and thus would be at the top of your order. Therefore, your answer should be: 3
1
2

You may find this set helpful. Again, decide on the order of the objectives and state your reason.

1. Distinguish heavier and lighter objects with an equal arm balance.
2. Order objects according to weight by making comparisons using an equal arm balance.
3. Distinguish the relative weight of objects by lifting.

(SAPA, B-n

Your order is:

Your reason for your order is:

Which task does # 2 depend upon?

Which task does # 3 depend upon?

Which task does # 1 depend upon?

Discussion of Your Answer

Task # 2 depends on # 3 and # 1.
Task # 3 depends on no other tasks.
Task # 1 depends on # 3. Therefore,
the correct order is: 2
1
3

You are now ready for the Competency Appraisal. When you have completed it, please have it scored by your instructor.

Discussion of Task Focus

Your order should have been:

3 A
1 B
2 C

If you think back, identify is usually a simplier task than construct; hence, B before C. However, A requires both B and C, so it is considered the most complex behavior in the collection.

COMPETENCY APPRAISAL

Order the following set of objectives (by numbering 1, 2, 3) according to the complexity of the objective--from simplest to most complex.

_____ a. Distinguish a right angle from other angles.

_____ b. Identify a "square corner" as an example of a right angle.

_____ c. Identify angles.

INSTRUCTIONAL DESIGN TASK # 9A

Task Objective

Given the instructional objective, identify prerequisite and related skills.

Task Focus

Below is an instructional objective and a set of skills. Code each skill as:

a = prerequisite skill necessary for child to achieve the objective
b = skill related to objective but not prerequisite
c = skill not related to objective

At the end of this activity the child will be able to state and demonstrate which of two angles is larger by superimposing one angle upon another.

(SAPA, B-s)

_____ 1. The child can identify angles.

_____ 2. The child can describe why some angles are right angles.

_____ 3. The child can distinguish the relative size of two angles by super position.

_____ 4. The child can estimate, by observing, which of two angles is larger.

See page 4 for Discussion of Task Focus.

Task Activities

For this objective, a teacher was concerned about prerequisite skills children would need to succeed with the objective. Rate the following skills as:

a = prerequisite skill necessary for child to achieve the objective
b = skill related to objective but not prerequisite
c = skill not related to objective

At the end of this activity the child will be able to describe a sufficient number of properties of an object (such as color, length, shape, texture, or smell) so that a second person can identify the object.

(SAPA, B-h)

_____ 1. The child can make observations using all five of the senses.

_____ 2. The child can make inferences based on observations.

_____ 3. The child can identify his favorite colors and smells.

_____ 4. The child can construct a classification of five objects.

Look back at your coding. Which skills are essential for success in describing? You probably coded #1 as "a" because to tell about an object's color, smell, texture, etc., one must be able to observe it with the senses. Related to the task but not the learner's (child) responsibility is making an inference, using the descriptive observations of the child to identify the object, thus #2 is coded "b". Numbers 3 and 4 are coded "c" as they are not related in any way to the objective.

Here is another set to try.

At the end of the activity the child will be able to state that one object is heavier than another because the earth-pull on that object is greater than it is on the other.

(SAPA, B-n)

Code the following skills:

a = prerequisite skill necessary for child to achieve the objective
b = skill related to objective but not prerequisite
c = skill not related to objective

_____ 1. The child can demonstrate the use of an equal-arm balance for comparing the weight of a one-pound and a five-pound object.

_____ 2. The child can order objects by size.

_____ 3. The child can interpret weight as a force resulting from the pull of the earth on objects.

_____ 4. The child can demonstrate the use of an equal-arm balance for comparing the weight of a one-pound and a $1\frac{1}{8}$ pound object.

Which skill did you rate "a"?

For what reason?

Which skill did you rate "b"?

Your reason?

Which skill did you rate "c"?

Your reason?

Could you revise the skills you coded "b" and "c" so that they become prerequisite skills?

Discussion of Your Answers

Did you code #3 as "a"? This skill is, of course, the basis for being able to perform the objective. Coded "b" should be #1, as the objects in this case have a gross difference in weight and can be judged "heavier than" by heft or lifting. The skill of using a balance would indeed be necessary if the objects were of a discrete weight difference, so it becomes a prerequisite skill if the objects weight one pound and 1-$\frac{1}{8}$ pounds; therefore, #4 is coded "a". Coded "c" should be #2, as size as a comparing factor is completely irrelevant to the objective. If the ordering were made on the basis of weight, then it becomes a part of this objective.

You are now ready for the Competency Appraisal. When you finish it, please have it scored by the instructor.

Discussion of Task Focus

#1 is rated as "a" since a child must be able to know what an angle is before he can determine if it is larger or smaller than another. It is completely irrelevant for purposes of this objective for the child to describe right angles or any other kinds of angles; therefore, code #2 as "c". Number 3 is coded "a" since the child must be able to distinguish before stating and demonstrating which of two angles is larger. Number 4 is coded "b" since it would be helpful to the child in initiating his superimposing of the angles to estimate which is larger, but not necessary to his success.

COMPETENCY APPRAISAL

Below is an instructional objective and a set of skills. Code each skill as:

a = prerequisite skill necessary for child to achieve the objective
b = skill relates to objective but not prerequisite
c = skill not related to objective

At the end of this activity the child will be able to construct a bar graph.

(SAPA, B-p)

_____ The child can construct a line graph.

_____ The child can demonstrate the meaning of vertical and horizontal.

_____ The child can construct circular graphs.

_____ The child can state the conventions of graphing.

INSTRUCTIONAL DESIGN TASK # 9B

Task Objective

Given the instructional activity, identify prerequisite and related skills.

Task Focus

The following is a set of skills and an instructional activity. Code each skill as:

a = prerequisite skill for child to succeed with activity
b = skill related to activity but not prerequisite
c = skill not related to activity

> The teacher placed a honeycomb, some lumps of sugar, some pieces of sweet chocolate, an orange, a grapefruit, a lemon, some cookies, and several kinds of salted crackers and pretzels on children's trays. She asked the children to taste the foods and group them in three groups and name the groups.
>
> (SAPA, A-r)

_____ 1. The child can identify the sweet food he prefers above others.

_____ 2. The child can distinguish food tastes as alike or different.

_____ 3. The child can distinguish tastes that are sweet, sour, and salty.

_____ 4. The child can construct a multistage classification system based on observable properties of objects.

See page 4 for Discussion of Task Focus.

Task Activities

Before involving her class in the following activity, the teacher considered some skills the children might need to be successful with the activity. Code the skills as:

a = prerequisite skill for child to succeed with activity
b = skill relates to activity but not prerequisite
c = skill not related to activity

The teacher planned to give each child some crushed ice in a petri dish, along with a paper towel and a thermometer. She planned to ask the children to observe the ice change and to describe the changes.

(SAPA, A-n)

The ckills the teacher was concerned about follow. Please code them as directed.

_____ 1. The child can identify the chemical components of crushed ice.

_____ 2. The child can distinguish between solid objects that melt and those that do not.

_____ 3. The child can distinguish between temperature at two different times using a color-coded thermometer.

_____ 4. The child can describe two or more characteristics of an object.

Discussion of Your Answer

The first statement represents an unnecessary skill and should be rated "c". Statement #2 is "b", a related skill, which suggests that when the child is given several substances, such as ice, butter, and clay, he can distinguish between those which melt and those which do not--given the circumstances surrounding the objects. Statements #3 and #4 are coded "a" because they are skills the child will need to call upon to describe the ice as it changes.

In another activity the teacher gave the children cardboard charts and asked them to keep an hourly record of the temperature and weather conditions.

(SAPA, B-g)

The following pupil skills should be coded:

a = prerequisite skill for child to succeed with activity
b = skill relates to activity but not prerequisite
c = skill not related to activity

_____ 1. The child can identify and name the time on the hour from a clock.

_____ 2. The child can distinguish between weather conditions at different times by examining the weather chart.

_____ 3. The child can name the temperature in degrees, using a thermometer.

_____ 4. The child can name and construct symbols for weather conditions.

Which skill did you code "a"?

What is your reason?

Which skill did you rate "b"?

Why did you?

Did you rate any as "c"?

Discussion of Your Answer

If children are going to be able to record weather conditions hourly, they must be able to do skills #1, 3, and 4. Number 2 is a related, "b", skill but not one called for in this activity. There were no skills rated "c".

You are now ready for the Competency Appraisal. When you finish it, please have it scored by the instructor.

Discussion of Task Focus

Number 1 should be coded "c" as indicating food preferences is not in any way related to this activity. Numbers 2 and 3 are coded "a" since the child needs skills in distinguishing tastes to be able to group the foods on this basis. Number 4 is coded "b" as it is related to the grouping of the foods and might be a profitable activity to move into, once the three groups of foods are arranged and named.

COMPETENCY APPRAISAL

Below is an instructional activity and a set of skills. Code each skill as:

a = prerequisite skill for child to succeed with activity
b = skill relates to activity but not prerequisite
c = skill not related to activity

The teacher placed an elongated cylinder on a projector and rotated the cylinder (which could not be seen) so that two differently shaped shadows were projected. The teacher asked what the names of the shadows were, and what the class thought the name of the object on the projector was.

(SAPA, B-q)

_____ The child can rotate cylinders to cast two different shadows.

_____ The child can name the two-dimensional shapes that the teacher draws.

_____ The child can identify and name objects in the room shaped like cylinders.

_____ The child can identify a soup can as a cylinder.

INSTRUCTIONAL DESIGN TASK # 10

Task Objective

Construct an adequate behavioral objective appropriate to a given instructional activity.

Task Focus

The following is a description of an instructional activity for young children.

> Give each child a cardboard tray containing five objects some of which are made of wood, some of metal, and some of plastic. Allow the child time to examine the objects with their magnifiers. Then tell the children to sort their objects into groups.
>
> (SCIS- Material Objects)

State two performance objectives or two behavioral objectives for this instructional activity.

At the end of this activity the child should be able to:

See page 3 for Discussion of Task Focus.

Task Activities

> In a second grade class, children have been observing an aquarium. With the teacher helping, they have made a list of all the objects in the system. Then the teacher asked the students to group the objects into two groups. Many ideas resulted. She put these two groups on the chalkboard.
>
> | | |
> |---|---|
> | Fish | Water |
> | Plants | Sand |
> | | Bubbles |
>
> and asked the children to name her groups.
>
> (SCIS-Organisms)

List two performance objectives for this activity. At the end of this activity the child should be able to:

Discussion of Your Answer

Your objectives might have included the child describing or identifying or naming the objects in the aquarium, grouping of classifying the objects, or naming the basis of the teacher's grouping.

In a first grade class, a teacher gave each child a paper and a crayon. She made a large triangular-shaped area on the floor with masking tape and then drew a similar shape on the chalkboard. She asked the children to make a similar shape on their paper. She then put an X on the corner of the drawing on the board and asked a child to go to that place on the triangular shape on the floor. After he followed the directions, she had each child mark his paper with an X to show where the child was standing.

(SAPA, A-m)

What are two performance objectives for those activities?
At the end of this activity the child should be able to:

1. ______________________________

____

2. ______________________________

____

Discussion of Your Answer

In your objectives you may have included:

Construct a triangular shaped area.

Follow directions.

Construct a diagram.

Identify with an X the location of a person on a diagram.

Now let's try this.

In response to the question, "What makes us move?" children were experimenting with skate boards. At first they took turns moving their skate boards along the room. Then two children who weighed about the same were paired to push each other. Someone wondered if it mattered who pushed first. So first one, then the other, did the pushing. The class then tried the same experiment with children of different weights. When the teacher tried it, all were surprised to see that the student's skate board went much farther than the teacher's.

(ESS-Slips & Slides)

For the fifth grade children, name two performance objectives that they should be able to do by the end of the activity described. At the end of this activity the child should be able to:

1.

2.

Discussion of Your Answer

There are a number of performances toward which the teacher could be directing the children's learning experience. For example, one might be to help children distinguish between observing motion and inferring the reasons for that motion. Another might be to help children construct a rule about the relationship between weight or mass and motion. A possible third, might be for children to identify variables that could be manipulated in their experiment. There are many others. Were your choices obsevable behaviors?

Discussion of Task Focus

This activity includes two specific behaviors for children.

1. The child identifies properties of different objects.
2. The child classifies the objects based on properties he has observed.

You are now ready for the Competency Appraisal. When you have completed it, please have it scored by your instructor.

COMPETENCY APPRAISAL

The following is an instructional activity for children:

Hold up a pyramid in various orientations. Ask: What two-dimensional shapes can be seen in the pyramid? (Triangles, square on the base.) Have them demonstrate the shapes with their fingers.

Now pick up the one and let the children identify the shapes they see. They will name the circle and some may say they see a triangle. If they have difficulty identifying the triangle, hold the cone next to the chalkboard and trace its edges. When the cone is removed, ask, "What shape is drawn on the board? This same procedure may be helpful in identifying the rectangle that may be associated with a cylinder.

State two performance objectives of the instructional activity given above.

____

____

INSTRUCTIONAL DESIGN TASK # 11

Task Objective

Identify at least two situations in which children will demonstrate the behavior described in the objective.

Task Focus

Below are two sets of objectives and possible student activities. Rate each activity as

a = irrelevant to the objective
b = possibly related to the objective
c = demonstrates the behavior described in the objective

Objective: At the end of this activity the child will be able to construct a prediction using a graph.

Possible Student Activities:

_____ 1. Give the students a graph of the accumulated rainfall for the past ten years.

_____ 2. Have the students graph their spelling grades.

_____ 3. Give the students a graph of the burning time of a candle in jars of different sizes between 40 ml and 600 ml. Ask them to tell you how long a candle will burn in a jar of 100 ml.

_____ 4. Show the class a film on prospecting for uranium--one that emphasizes how they use graphs to predict the presence of uranium.

Objective: At the end of this activity the child will be able to describe how the field of vision, that is, how much one can see, depends upon the distance of the object from the viewer.

_____ 1. Have the child tell you how much more he can see when he moves away or twoard the bulletin board.

_____ 2. Have the child look in a microscope and tell you what he sees.

_____ 3. Show the children a movie on the refration of light.

_____ 4. Describe the relationship between angles of incidence and angles of reflection.

See page 5 for Discussion of Task Focus.

Task Activity

For the first activity, use this answer sheet with the filmstrip and tape "Appropriate Practice." If you need any assistance in setting this up, please see the instructor.

APPROPRIATE PRACTICE ANSWER SHEET

1. A B
2. A B C
3. A B C
4. A B
5. YES NO
6. YES NO
7. YES NO
8. YES NO
9. YES NO

NOTE: Task #11 uses only the first 16 frames of the film strip, and from 0-390 on the tape counter.

Task #12 uses the remainder of the tape and filmstrip; therefore, if your need to work on #12, you may find it more efficient to work on this task simultaneously with #11, while you have the projector and recorder in operation.

Now let's try a practice task.

With this objective, a teacher was deciding which activities to select. How do you think she should rate these activities? Use:

a = activity which is irrelevant to the objective
b = activity which is possibly related to the objective
c = activity which clearly demonstrates the behavior described in the objective

Objective: At the end of this activity the child will be able to identify animal responses to identified stimuli.
(SAPA, C-t)

_____ 1. Have children describe what their puppy does when they come home from school.

_____ 2. Have children describe the food preference of turtles.

_____ 3. Have children find out what happens when you touch a meal worm on its head.

_____ 4. Have children flash a bright light on the side of an aquarium.

_____ 5. Show a movie of nature's camouflage.

Discussion of Your Answer

As you are rating these activities, you will find it helpful to decide which activity will result in children displaying the behavior described in the objective. Your analysis probably rated #1 and 3 as clear illustrations of the objective. Related to the objective but not a complete illustration of it, and hence rated "b", are #2 (food may be a stimuli but children are not asked to relate it to the response of the animal) and #4 (the light is certainly a stimuli, but the activity will not suggest that children's attention will be focused on the result of light being a stimuli). The movie suggested in #5 is not relevant and should be rated "a".

How would you modify #2 to make it have a "c" rating?

How would you modify #4 to give it a "c" rating?

How would you modify #5 to give it a "c" rating?

Discussion of Your Answer

To modify #2 so it would have a "c" rating, it is necessary for children to describe how turtles respond to different kinds of foods. Similarily for #4, children need to identify how various organisms in an aquarium respond to a flash of bright light. #5 is a more difficult one; however, children first identify specific stimuli (for example, an unusual sound or animal call) and then they describe responses which they think are related to the stimuli (call).

Here is an objective for a reading lesson.

> At the end of the lesson the child should be able to describe the use of adjectives in a sentence.

Describe three activities you could use with children, at any grade level you wish to specify.

Grade Level_______

Suggested Activities

1.

2.

3.

You are now ready for the Competency Appraisal. When you have completed it, please have it scored by the instructor.

Discussion of Task Focus

When you consider the behavior asked for in #1 and #4, they are both related to the objective, but neither call for the student to exhibit the complete behavior. Thus, this should be rated with "b". Number 2 is really not much related, although the students may be called upon to use the graph to predict. It should be rated "a" or "b". Number 3 describes the student doing what is pictured in the objective--using a graph to predict, and should have a "c" rating.

In the second group, #1 should be rated "c", #2 should be rated "b", #3 should be rated "a", and #4 should be rated "a".

COMPETENCY APPRAISAL

Below are 2 sets of an objective and possible student activities. Rate each activity as:

a = irrelevant to objective
b = possibly related to objective
c = demonstrates behavior described in objective

Objective: At the end of this activity the child will be able to name the three principal colors: red, yellow, blue.

_____ Have the child pick out all the purple beads in a set of vari-colored beads.

_____ Have the child tell the color of the (red) dictionaries.

_____ Have the child print the word red on his spelling test.

_____ Have the child match a strip of red paper to all red objects in the room.

Objective: At the end of this activity the child will be able to identify and name fractional parts of a unit, using decimal notation and tenths.

_____ Give the child 10 washers and ask him to separate them in two piles and write a numeral representing the decimal part of the washers in each pile.

_____ Ask the child how many tenths there are in 100.

_____ Ask the child to write the decimal fraction of 5/10.

_____ Ask the child to draw a line segment 100 mm long.

INSTRUCTIONAL DESIGN TASK # 12

Task Objective

From a set of alternative instructional activities, identify those which can be used to help children acquire the desired behaviors.

Task Focus

The following are objectives of a science lesson.

1. At the end of this activity, the child will be able to identify and name the north- and south-seeking poles of a magnet.
2. At the end of this activity, the child will be able to identify the interactions that can be observed directly of two objects.

(SAPA, D-n)

Rate each of the following student activities as:

a = irrelevant to the objective
b = instructional experience using real objects
c = instructional experience using likenesses of real objects.

_____ 1. Show a movie on the interaction of magnets.

_____ 2. Give the students unmarked metal bars and have them identify which are magnets.

_____ 3. Demonstrate how one uses a compass, with a cardboard model.

_____ 4. Have students mark with red tape the south-seeking poles of unmarked magnetic cylinders.

_____ 5. Discuss the discovery of the Van Allan Radiation Belt around the earth.

See page 6 for Discussion of Task Focus.

Task Activity

To help you with this task, please use this sheet with the filmstrip and tape entitled, "Appropriate Practice."

NOTE: This task does not employ the initial parts of the filmstrip and tape (it is used for task #11). Therefore, note the following directions:

For filmstrip - set on FOCUS frame, move and count 17 frames so that you begin with a picture of 3 gold and white cubes.

For tape - listen carefully for the first bell "ding," STOP the tape immediately, reset the counter on 0, then advance the tape on forward to 390, stop, and begin play.

If you need help with setting this up, please check with your instructor.

APPROPRIATE PRACTICE ANSWER SHEET

10. (EQUIVALENT/ANALOGOUS)

A________________________

B________________________

11. (EQUIVALENT/ANALOGOUS)

A________________________

B________________________

12. (EQUIVALENT/PREREQUISITE)

A________________________

B________________________

13. (EQUIVALENT/PREREQUISITE)

A________________________

B________________________

C________________________

14. (EQUIVALENT/ANALOGOUS/PREREQUISITE)

A________________________

B________________________

15. (EQUIVALENT/ANALOGOUS/PREREQUISITE/IRRELEVANT)

A________________________

B________________________

C________________________

D________________________

16. ________________________

17. ________________________

18. ________________________

19. EQUIVALENT________________

ANALOGOUS________________

Now let's do some practice with a set of science activities. Here are the objectives for a set of activities.

1. At the end of this activity, the child will be able to construct a bar graph.
2. At the end of this activity, the child will be able to identify and name the number of items represented by the bars of such a graph.

(SAPA, B-p)

Rate these activities:

a = irrelevant to objectives
b = instructional experience using real objects
c = instructional experience using likenesses of real objects

_____ 1. For each colored block in their hand, have children place a colored felt square in a column on the felt board.

_____ 2. Children decide which color to paint the bars on a dittoed graph of the toys in the room.

_____ 3. Children describe how many more blue sweaters that were worn yesterday than red sweaters.

_____ 4. Children observe the teacher construct a graph of the number of sweaters of different color worm.

_____ 5. Children are skillfully told about the importance of graphs and the lesson they are about to learn in how to make a graph.

Which ones did you rate "b"?

With which objectives did each activity fit?

Which activity did you rate "c"?

What was the reason for your choice?

Did you have any rated "a"?

What was your reason for this?

Discussion of Your Answer

If you think back, children were involved in firsthand experiences in #1, 2, and 3. However, #2 is really not related to the objective in any way, hence, it should be rated "a", while the others are rated "b".

Children were passive, that is, listening, and having a secondhand experience in #4 and 5. Since #4 is a demonstration relative to the objective, it should have been rated "c", whereas, #5 has no relationship to the instructional objective and should be rated "a".

Here is another set of objectives.

1. At the end of this activity the child will be able to demonstrate a method for collection and organization of simple data.
2. At the end of this activity the child will be able to construct a bar graph to represent a collection of data.
3. At the end of this activity the child will be able to construct a prediction based on examination of the data in a graph.

(SAPA, C-w)

Write one activity for each objective that would illustrate a child having an experience using real objects.

Objective 1

Objective 2

Objective 3

Now write an activity that would illustrate an experience using likenesses of real objects, directed toward these experiences.

Briefly describe two activities that would be related but would be irrelevant to the objectives.

Discussion of Your Answers

In an instructional experience using real objects, the activity should provide for children to manipulate these objects.

On the other hand, instructional experiences using likenesses of real objects might have children use pictures or written descriptions of objects.

A related activity but one which is irrelevant to the objective is one which might be part of the same topic or content, but does not involve children in the behaviors described in the objective.

You are now ready for the Competency Appraisal; please have it scored by your instructor when you are completed.

Discussion of Task Focus

Activities should be selected because they are based on their direct relationship to the instructional objectives. In this case, #2 and #4 should be rated "b" since they are activities that use real objects and are experiences for students directly related to the objectives. Instructional experiences using likenesses of real objects are illustrated in #1 and #3. Number 5 is really irrelevant to the objectives and should be rated "a".

COMPETENCY APPRAISAL

The following are objectives of a science lesson:

1. At the end of this activity the child will be able to identify and name variations among objects and organisms which may have many features in common.
2. At the end of this activity the child will be able to describe features which are common for each member of a group.

Rate each of the following student activities:

a = irrelevant to objective
b = first hand instructional experience
c = vicarious instructional experience

____ Ask the child to state the similarities and differences in his sunflower seeds which differ in size, shape, color, and skin texture.

____ Give each child 8 pecans and ask them to find as many ways as they can in which one pecan is different from another.

____ Ask children to describe the differences they observe in a collection of dried wildflowers.

____ Ask children to describe the differences found in flowers illustrated in a seed catalog.

____ Ask children to prepare a mural with their magazine pictures of flowers.

____ Ask children to divide 10 rocks into two groups and tell why.

INSTRUCTIONAL DESIGN TASK # 13

Task Objective

Construct an appraisal item for a given behavioral objective.

Task Focus

The following objective was on a teacher's plan. Write an appraisal item appropriate for this objective.

OBJECTIVE: At the end of this activity, the child will be able to name a known object that is approximately the same length or width as another object.
(SAPA, C-j)

Appraisal Item:

See page 4 for appropriate response.

Task Activity

For the first activity, you will need to use the answer sheet with the filmstrip and tape "Evaluation." If you need help in setting this up, please check with your instructor.

EVALUATION PROGRAM

ANSWER SHEET

1.____

____

2.____

____

3.____

____

4. A B C

5. A B

6. A B

7. A B

8.____

____

9.____

____

10.____

____

11. A B

12. A B

13. A B

14.____

____

15.____

____

16. A B

Check yourself on this one.

Here is the objective of a science lesson for children in the second grade.

> At the end of this activity, the child will be able to construct a grouping into living and nonliving objects on the basis of observable characteristics.
>
> (SAPA, B-a)

Write what you think would be an acceptable appraisal item.

Discussion of Your Answer

1. Did your appraisal item specify what objects or situations you would use?

e.g. Have an aquarium located where all the children can observe it.

2. Did your appraisal item specify what you would say or do to involve the student?

e.g. On a sheet of paper list all the objects in the system that you think are alive. Be ready to tell me the reason for your list. On a second sheet of paper tell me all the things that are nonliving, and be ready to tell me your reason.

Here is another objective. Write an appraisal item for it.

> At the end of this activity, the child will be able to understand and use the word interact.
>
> (SCIS - Interaction)

Appraisal Task:

Discussion of Your Answer

Did your task describe the specific situation you would use and what you would say or do? Such as Show the child a picture of a dog and a cat whose back is arched and whose hair is standing straight. [situation] Ask the child to tell you a story about the picture, using the word interact. [what you would do]

For a final practice, select and state an objective in any area you wish, and then write what you think would be a suitable appraisal item.

Objective:

Appraisal Task:

Discussion of Your Task

If you described a situation (including what to use and what to say), so that your neighbor could do it, your appraisal task is probably correct.

You are now ready for the Competency Appraisal. When completed with it, please have it scored by your instructor.

Discussion of Task Focus

Your appraisal item should state specifically:

1. what object or situation you will use.
2. what you will say or do to involve the student.

e.g. Hand the child an unsharpened pencil and have him write down the names of two other objects in the room that he thinks are about the same length. NOTE: He may not measure or find out before he names them.

COMPETENCY APPRAISAL

Select one objective (and indicate your choice by underlining) and write an appraisal item appropriate for the objective.

Grades 1 & 2: At the end of this activity the child will be able to describe common environmental objects, such as animals, in terms of two- and three-dimensional shapes.

Grades 3 & 4: At the end of this activity, the child will be able to distinguish whether or not 2 objects dropped from the same height and at the same time strike the floor at about the same time.

Grades 5 & 6: At the end of this activity the child will be able to apply a rule for finding the distance a wheel rolls given the circumference of the wheel and the number of rotations it makes.

Appraisal item: ______________________________

____

____

____

INSTRUCTIONAL DESIGN TASK # 14

Task Objective

Describe how to present an appraisal task to a child.

Task Focus

The following is a description of an appraisal task for the specified objective. Describe what you would say or do to involve the child with this task.

Objective: At the end of this activity the child will be able to order objects by length from the shortest to the longest.

Appraisal Task:

Give the child a set of crayons of random length, but make sure that there are three or four subsets of two or three crayons each of the same length.

(SAPA, A-k)

What would you say or do to involve the child in this task?

See page 4 for Discussion of Task Focus.

Task Activity

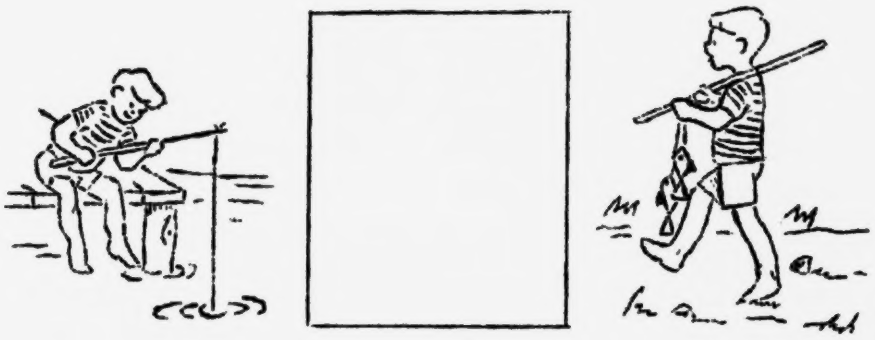
For this objective the appraisal tasks are stated. What would you as a teacher need to say or do to involve the child?

Objective: At the end of this activity the child will be able to construct one or more inferences from an observation or a set of observations.

(ASAP, D-a)

Appraisal Task:

Provide each child with a copy of this diagram:



What would you say or do to involve the child in this task?

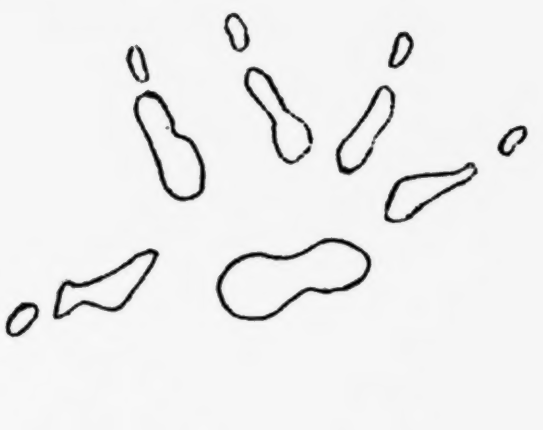
Look back at your answer. If the child did what you asked him, would he have to construct an inference? Would the inference he constructed be done in such a way that you would be able to observe his response?

Here is another objective.

Objective: At the end of this activity, the child will be able to distinguish between observations and inference.
(ASAP, D-b)

Appraisal Task:

Provide the child with a copy of the animal print and this list of statements.



1. An animal with sharp claws made that foot print.
2. An animal with sharp teeth made that footprint.
3. The footprint is as wide as my foot.
4. The animal has five toes.
5. The animal has toenails.
6. The animal has a padded foot.

What would you say or do to involve the child in this task?

Check your answer.

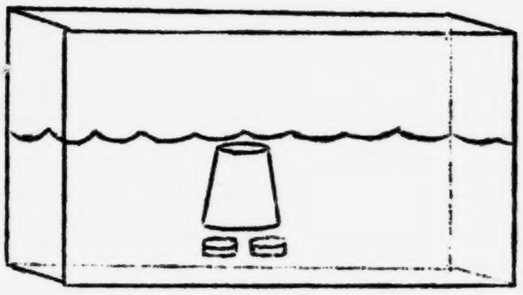
1. Did what you have the child do actually cause him to distinguish between observations and inferences?
2. Did you have him do it in such a way that you could observe his ability to make this distinction?

For another practice try this one.

Objective: At the end of this activity the child will be able to construct an inference to explain an observed event.
(SAPA, D-e)

Appraisal Task:

Using an aquarium half full of water, invert a glass which is full of water. Then place 2 alka seltzers directly under that glass.



What would you say or do to involve the child in this task?

Discussion of Your Response

In what you asked the child to do, was it necessary for him to explain why the event occurred rather than just to describe what occurred?

You are now ready for the Competency Appraisal. Please have your instructor check this when you are finished.

Discussion of Task Focus

The key to an acceptable response here would be for you to say or do that which will cause the child to use the crayons in such a way that you will be able to observe his ability to order them. One way to do this is to say, "Arrange the crayons according to their length." You will be able to see if the child's action matches the action verb, that is, order; and you will be able to observe his behavior, that is, it will be something you can see.

COMPETENCY APPRAISAL

Following are 3 sets of objectives and appraisal tasks. Select one (indicate by underlining) and describe what you would say or do to involve the child with this task.

Grades 1 & 2:

Objective: At the end of this activity, the child will be able to order containers by volume, when ordering is not obvious by inspection, by pouring liquid or a finely divided solid (such as sand) from one container to another.

Appraisal Task: Bring in (or have the children bring in) a collection of boxes of various sizes and shapes--shoe boxes, oatmeal boxes, boxes from dry cereal, and so on. Also have about ten identical, small unit-volume boxes or fruit cans, as well as sand or other materials to pour.

Grades 3 & 4:

Objective: At the end of this activity, the child will be able to describe observations that can be used to test inferences about the displacement of water by air.

Appraisal Task: Fill a wide-mouth transparent bottle about half full of colored water. Insert a kitchen baster about halfway into the water. Slowly squeeze the bulb and release it.

Grades 5 & 6:

Objective: At the end of this activity, the child will be able to demonstrate that in some materials, a liquid moves upward faster than it does in others.

Appraisal Task: Joe has been given two pieces of cloth.

INSTRUCTIONAL DESIGN TASK # 15

Task Objective

Identify and construct two alternative means for initiating instruction.

Task Focus

The following is a set of objectives and a brief description of the science topic.

Objective: At the end of this activity the child will be able to identify variables that might affect the time a round object takes to roll down an inclined plane.

(SAPA, E-b)

Task Background:

Using an inclined plane and a set of solid and hollow cylinders composed of steel, plastic and aluminum, and each type of four different lengths, it is possible to pick out the cylinder (or cylinders) that will win the race down the inclined plane when raced in pairs.

Rate each of the following initial activities as:

a = unrelated to the objectives
b = related to the objectives, high teacher control
c = related to objectives, high student control

_____ 1. Find the winner and suggest your reason for its success.

_____ 2. Tell the children that the solution to the problem involves a principle of physics: rotational speed is related to the location of mass around the axis of the cylinder.

_____ 3. Find the winner or winners.

_____ 4. Roll the cylinders in pairs and tell me which cylinder will roll down the board in the shortest time. For what reason is that true?

See page 5 for appropriate responses.

Task Activities

For this objective and this lesson, here are some ways a teacher considered starting the lesson. Rate the starting activities as:

a = unrelated to the objectives
b = related to objective and high teacher control
c = related to objectives and high student control

Objective: At the end of this activity the child will be able to identify objects which have line or plane symmetry.
(SAPA, B-b)

Task Background:

Symmetry, or the lack of it, is an important characteristic of plants, animals, and crystals. The recognition of this property is frequently very helpful in describing and classifying objects in our physical and biological environment. Symmetry in an object, as the term is used in this exercise, may be defined as the repetition in size, form and arrangement of parts of opposite sides of a plane, line, or point. In ideal shapes, such as circles, squares, and spheres, the repetition of parts is exact on opposite sides of the line or plane of symmetry. On the other hand, in objects found in our environment, (plants, animals, crystals) the repetition of parts is not exact. Nevertheless, the repetition is close enough to being exact that we say certain plants, animals, and crystals are symmetrical. In many cases, two dimensional figures can be folded so that one half has a point-for-point correspondance with the other half. They have matching halves and the line along which they are folded is said to be the axis of symmetry or the line of symmetry. A square has four of these axes; a rectangle has two. A circle has an infinite number. Thus, one way of classifying plane figures might be on the basis of the number of axes, or the lines of symmetry.

_____ 1. Show the class two bulletin boards one of which has symmetrical objects and the other non-symmetrical objects. As you fold and match the sides of the symmetrical objects, ask the children how these objects are alike.

_____ 2. Have the class guess your secret as you make two piles of cut outs: one which you cut before you fold the paper, and the other which you cut after you fold the paper.

_____ 3. Discuss the formation of crystals and the types of solution concentrates which are necessary.

_____ 4. Demonstrate that two sides of a Christmas tree cut from a piece of construction paper will be the same or will match if you fold the paper before you cut the tree.

Which are unrelated to the objective? #3 should be rated "a". #2 is both related to the objective and requires most of the action by the student, should be rated "c".

Look back at your ratings. Which activities require the least action on the part of the student? You probably identified these as #1 and #4. Since #1 and 4 are related to the objective, but are highly structured by the teacher with minimal involvement of the students, they should be rated "b". An initial activity will be more effective if it (1) requires student to do what the objective describes, and (2) depends upon the student's action rather than the teacher doing it all.

How could you change #1 to make it have a rating of "c"?

What did you change in your revision that justifies giving it a rating of "c"?

Discussion of Your Change

To change #1 to a rating of "c", one possibility is to have children describe how the two bulletin boards differ from each other; then have the children demonstrate their description by cutting objects and placing them on the appropriate board.

You will note that the modification shifts the responsibility for action from the teacher doing it to the student doing it.

Here is another topic.

Objective: At the end of this activity the child will be able to identify variations in the growth of the same kind of plant. (SCIS-Environments)

Topic Background:

When children observe the change in the height of a growing bean plant, they will quickly see that all bean plants do not grow the same height every day. If they plant different kinds of bean seeds, sunflower and clover seeds, this observation will be even more obvious.

To initiate a discussion of this event, rate these suggestions as:

a = irrelevant to the objective
b = related to the objective, but high teacher control
c = related to the objective, high student control

_____ 1. What ideas do you have about the height of the plants on the seventh day?

_____ 2. Are all the clover plants the same height?

_____ 3. Tell me about your observations of the plants.

_____ 4. Which plants are the tallest today?

_____ 5. Why do plants grow?

_____ 6. Which plant has chlorophyll?

Which suggestion did you rate "a"?

For what reason?

Which suggestion did you rate "b"?

Your reason?

Which suggestion did you rate "c"?

Your reason?

Look back at the suggestions you rated "b". Restate them so that they might be rated "c".

Discussion of Your Answers

#6 should be rated "a" because chlorophyll is not a variation in the topic as described. #2 and #4 are rated "b" since they are related to the objective but the task is mostly formulated by the teacher. The students' responsibility is to provide short, fill-in-the-blank kind of answers. #1, 3, 5, require the student to assume a much greater responsibility in deciding what aspects about the plants he is going to discuss.

To change #2 and #4 from a "b" to a "c" would be to restructure them so that students would respond more than with a yes or no. For example, "Are all the clover plants the same height?" could be changed to, "Tell me about the clover plants."

You are now ready for the Competency Appraisal. When you finish it, please have it scored by the instructor.

Discussion of Task Focus

The activities for this unit can be initiated in several ways. Giving a lecture as to the reason is really quite irrelevant to the objective, so #2 should be rated "a". Although #3 is related to the objective, when the student has completed it, he still will not have identified any variables. It should also be rated "a". When students have completed either #1 or #4 they will be doing the behavior described in the objective. In #1 it is up to the students to decide what to do (rate it with a "c"), whereas in #4, the teacher is largely structuring the situation (therefore, rate it a "b").

COMPETENCY APPRAISAL

Following is a set of objectives and a brief description of the topic of an exercise.

Objective: At the end of this activity the child will be able to identify the kinds of locomotion possible in animals of various shapes and with various kinds of appendages.

At the end of this activity the child will be able to demonstrate the characteristic "push" common to animals that walk or crawl.

Activity: An animal propels itself forward in a horizontal direction by pushing back against its surroundings. An animal on the land must push back against the earth or the object it stands on; a swimming animal must push back against the water; and a flying animal must push back against the air. The shape of the animal's body and appendages affects its pattern of movement.

Rate each of the following initiating activities of the teacher:

a = unrelated to objectives
b = related to objectives, high teacher control
c = related to objectives, high student control

_____ "Observe the caterpillar and tell me about it."

_____ "Observe the caterpillar and tell what kind of moth it will turn into."

_____ "Observe the caterpillar and notice the fine hairs along its back."

_____ "Observe the caterpillar and notice how it humps up in the middle when it crawls and be ready to tell how it does this."

_____ "Observe the caterpillar climb on the glass and ask a question about it."

INSTRUCTIONAL DESIGN TASK # 16

Task Objective

Identify and construct supplemental materials for those children who are able to continue the study initiated in the instruction.

Task Focus

Here is a set of objectives and a brief description of the topic.

Objective: At the end of this activity, the child will be able to construct predictions based on a series of observations that reveal a pattern.

(SAPA, D-m)

Topic Description:

In measuring the time a candle will burn inside an inverted jar, children can plot volume and burning time and find that one can predict the burning time using the volume of the jar or predict the volume using the burning time of the candle.

Rate the following bonus or extension activities as:

a = unrelated to the objective
b = related to objective and probably feasible
c = related to the objective, but probably requires many prerequisite skills and not feasible.

_____ 1. Have the child investigate the effect of the height of the jar and burning time.

_____ 2. Ask the child to explain why the candle goes out.

_____ 3. Have the child determine the percentage of the jars' volume that is carbon dioxide, and predict how burning time is based on the carbon dioxide content of the jar.

_____ 4. Have the child investigate the effect of candle height and burning time.

See page 6 for Discussion of Task Focus.

Task Activity

For this objective, the teacher involved the students in these series of activities.

Objective: At the end of this activity, the child will be able to identify the heavier object as the one which exerts the greatest force when two objects move at the same speed.

(SAPA, B-x)

Topic Description:

In observing the results of balls colliding with a box at the bottom of an inclined plane, children determine that those balls which are heaviest push the box further along the flat surface.

Rate these extension or bonus activities for this topic as:

a = unrelated to objective
b = related to objective and probably feasible
c = related to objective, but probably requires many prerequisite skills.

_____ 1. Have the child describe what damage would result if a rowboat and a steam boat hit a wharf when both were moving at the same speed.

_____ 2. Have the child determine the amount of work done by a ball when it hits a box.

_____ 3. Have the child identify what would happen if an automobile and a bicycle which were moving at the same speed were to hit another car that was not moving.

____ 4. Have the child state Newton's second law of motion.

Discussion of Your Answer

The first decision you must make about extension or bonus activities is: Do they relate to the objective? Numbers 1, 2, and 3 are all related to the behavior described in the objective whereas #4 is certainly very remote. It probably should be rated "a". Your second criteria is the question: Is the criteria reasonably within the child's capabilities? This is true for

#1 and 3, and thus they should be rated "b". Number 2 requires a child to know a technical definition of "work" and be able to compute or apply this rule, hence this activity should be rated "c".

Now let's try another.

Objective: At the end of this activity the child will be able to identify dead organisms in an aquarium.

At the end of this activity the child will be able to describe changes in an aquarium when organisms have died.

Task Description:

The death of an aquarium organism should not be ignored, nor should the dead organisms surreptiously be removed from the aquarium. Instead it should be left so children can observe and report the changes in the aquarium and on the decay of the dead organism. One cannot predict what will happen in each aquarium where there are dead organisms, but a variety of changes might occur.

A. The water might turn cloudy white due to the multiplication of bacteria and protozoa which feed on the dead organism.
B. Green algae may appear first around the dead organism and then throughout the aquarium. The organic matter acts as a fertilizer to promote the growth of algae.
C. A fuzzy white mold may sprout from the dead fish.
D. A white scum which may include some decay products may appear on the surface of the water.
E. Red and black material may appear among the sand grains. This material is bacteria which can multiply rapidly in the areas where there is little air.
F. The dead fish may float. Gases produced during decomposition are trapped inside the fish, causing it to rise to the surface.
G. There may be a strong odor of decaying organisms.

(SCIS-Organisms)

Rate these extension or bonus activities for this topic as:

a = unrelated to objectives
b = related to objectives and probably feasible
c = related to objectives but probably requires prerequisite skills

_____ 1. Have the child describe what he thinks is the source of the stuff in the bottom of the aquarium.

_____ 2. Have the child set up an experiment to verify the source of the decaying material on the bottom of the aquarium.

_____ 3. Have the child observe the aquarium and determine if any other organisms in the aquarium are eating the stuff in the bottom of the aquarium.

_____ 4. Have the child determine the fertility of the stuff on the bottom of the aquarium.

_____ 5. Have the child observe a film on bacterial action and decomposition.

Which action did you rate "c"?

What was your reason?

State how you would change that activity so that it would be rated as "b".

Write another activity that you could use as a bonus activity for this objective.

Discussion of Your Answer

You should have rated #1 and #2 as "b", inasmuch as these activities can be done by children with a minimum of technical skills. #3 and #4 should be rated "c" since they are related to the objectives but require skills in designing an experiment which are probably more complicated than the student can handle.

Here is another one.

Objective: At the end of this activity, the child will be able to state and apply a rule relating the circumference and diameter of a circle.

(SAPA, E-t)

Task Activity:

Have each child bring from home a jar, a lid, a tin can, or some similar object that is circular and between five and twenty cm in diameter. Select two or three distances in the room for each child to measure. You might choose the length or width of a desk, the distance between two marks on the chalkboard, the distance between two pieces of masking tape on the floor. Tell the children that you want them to measure the distances in two ways, using their circular object as a measuring stick. If the children need help, tell them to measure each distance by using the object as simply a measuring stick to see how many circles fit side-by-side, and secondly, by rolling the circular object along the distance and seeing how many times it goes around as it rolls over the distance.

Rate these activities as:

a = unrelated to the objective
b = related to the objective, but probably requires many prerequisite skills
cc = relates to the objective and probably feasible

_____ 1. Have the child find out how far his bicycle will roll if the wheel rotates once.

_____ 2. Have the child describe the origin of Pi.

_____ 3. Have the child find out how far his bike rolls when the pedals make one rotation.

_____ 4. Have the child find out what the linear speed of his bike will be if the pedals move at an angular speed of one rotation per second.

Which activity did you rate "c"?

What was your reason?

Revise this item so that it will be rated "b".

Discussion of Your Answers

#4 should be rated "c" because it involves complex formulas or rules which go considerably beyond that described in the objective. #3 is an illustration of how #4 could be revised so that it is a bonus activity both related to the objective and feasible. #2 is "a" and #1 is "b".

You are now ready for the Competency Appraisal. Please have it scored by your instructor when you are finished.

Discussion of Task Focus

The important factor to use in judging bonus activities is whether they are (1) related to the objective, and (2) reasonably within the child's conceptual capability. Numbers 1 and 4 illustrate those which fit both points and hence should be rated "b". Number 2 is not related to the objective and should be rated "a", whereas, #3 is related to the objective but has a prerequisite skill of the child determining the presence of carbon dioxide, which means it probably should be rated "c".

COMPETENCY APPRAISAL

Below is a set of objectives and a brief description of the topic of an exercise:

Objectives:	At the end of this activity the child will be able to state that the representation of an object--for example, the picture of an animal--is not always life-size. At the end of this activity the child will be able to state the relationship between the actual size of an animal and its representation when the scale is given. At the end of this activity the child will be able to demonstrate the procedure of indicating scale by drawing a line segment to represent a specific length.
Topic Description:	Children learn to accept representations of animals and objects as substitutes for the actual animals and objects. Many of the pictures they see or study are not life-size. The portrayal is either smaller or larger--a fact that is seldom pointed out to children. The assumption is that they can visualize the object in its correct size. The purpose of this exercise is to help the children appreciate the usefulness of scaling in visualizing an object in its correct size.

Rate the following bonus or extension activities, for those who has finished ahead of others, as

a = unrelated to objectives
b = related to objective and probably feasible
c = related to objectives but probably requires many prerequisite skills and not feasible

_____ 1. Give the child a piece of grid paper and a block and ask him to produce a drawing three times larger.

_____ 2. Ask the child to produce a map of the school neighborhood and indicate the scale.

_____ 3. Give the child a Fahrenheit thermometer and ask him to convert it to the Celsius scale.

INSTRUCTIONAL DESIGN TASK # 17

Task Objective

Identify acceptable student responses to appraisal tasks.

Task Focus

In a situation, which had this objective,

> At the end of this activity the child will be able to identify a two-dimensional projection when given a three-dimensional object.
>
> (SAPA, B-q)

students made these responses when given an object shaped like a cylinder. Please rate the student responses as:

a = unacceptable
b = acceptable if the child can clarify
c = acceptable

_____ 1. It's like a party hat.

_____ 2. It has a shape like a rectangle.

_____ 3. It's sorta like a curve.

_____ 4. The shadow is darker.

_____ 5. It has a point and straight sides.

See page 4 for Discussion of Task Focus.

Task Activity

In a science class, the children were given a collection of objects containing a button, an index card, a piece of foil, a paper clip, a crayon, a balloon, a plastic spoon, a thumb tack, and a rubber stopper. In this setting, the objective was:

At the end of this activity the child will be able to sort objects by the chosen property.

(SCIS-Material Objects)

The instructions were for the child to find the shiny objects. Please rate the student responses as:

a = unacceptable
b = acceptable if the child can clarify
c = acceptable

_____ 1. Foil, paper clip, and thumb tack

_____ 2. Balloon, button, and plastic spoon

_____ 3. Balloon and rubber stopper

_____ 4. Button, foil, paper clip, crayon, plastic spoon, and thumb tack.

Discussion of Your Answer

Checking the child's response can many times make you wonder just what he meant. First you need to decide if all the objects are shiny. (This is true for #1 and 4.) In #4 there were no objects included which did not belong; whereas in #2, the balloon was included. Number 4 should be clearly rated "c". You may need to learn more about both #1 and #2. Why did he not include more objects in #1? Why was the balloon included in #2? (Maybe balloons were included because they are shiny if they are inflated.) Therefore #1 and #2 should be rated "b". Number 3 appears to be clearly not appropriate and should be rated "a".

What would a child need to say for you to change #1 from "b" to "c"?

To change from "b" to "c", ask the child to tell you why he selected those three objects. Following his reason, ask him if he would like to add any others to the group.

Here is another example.

A group of fifth grade children were given a graph of the length of time guinea pigs ran a maze on different days. They were asked to

At the end of this activity the child will be able to describe changes in an animal's performance of a task which results from repeated trials or practice.

(SAPA, E-d)

Students made these responses. Rate them:

a = unacceptable
b = acceptable if the child can clarify
c = acceptable

_____ 1. The pig learned to find the food in a shorter amount of time.

_____ 2. The pig used less time on the 6th day than on the 4th day.

_____ 3. The pig used a more direct route and did less exploring on the 6th day than on the 4th day.

_____ 4. The pig got tired of the experiment.

_____ 5. The pig was hungrier on the 6th day than he was on the 4th day.

Which response did you rate "a"?

Why?

Which responses did you rate "b"?

Why?

What would you do to help the child clarify his response?

Discussion of Your Answer

Response #4 is rated "a" since there is no real evidence to support that interpretation of the experiment. Numbers 1, 3, 5 should be rated "b" since these are all inferences which have some support in the data. To help a child clarify any of these, it would be useful to ask him, "What evidence on the graph do you have for the inference (statements 1, 3, 5)?"

You are now ready for the Competency Appraisal. Please have it scored by the instructor when you are finished.

Discussion of Task Focus

If you use those responses that are related to the objective as acceptable, you should rate #2 with "c". Numbers 3 and 5 may be related, but they need clarification; whereas #1 and #4 are rated "a" since they do not relate to the objective.

COMPETENCY APPRAISAL

When given unpainted clay models of a monkey, a mouse, and a Mynah bird, children made the following responses in a lesson which has the following objective:

> At the end of this activity the child will be able to construct a classification of animals, using the senses as the only source of information.

Rate the responses as:

a = unacceptable
b = acceptable, if child can clarify
c = acceptable

_____ All three animals are grouped together because they all have tails.

_____ The mouse and monkey are grouped together because they have hair on their tails.

_____ The monkey and Mynah bird are grouped together because they both eat bananas.

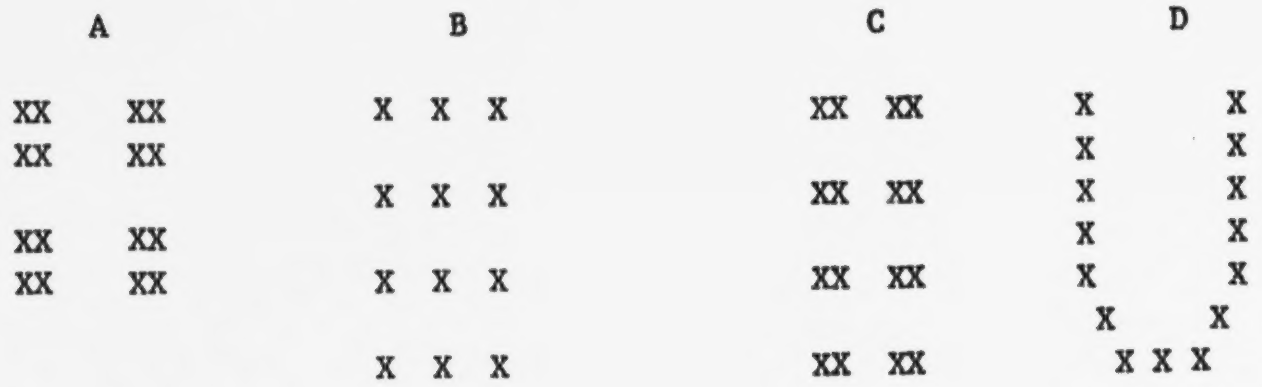
_____ The mouse and Mynah bird are grouped together because of their color.

INSTRUCTIONAL DESIGN TASK # 18

Task Objective

Describe room materials and children arrangement to fit an instructional plan.

Task Focus



Above are four room arrangements. Place the letter of the arrangement which best fits each instructional activity.

_____ 1. Each group of children was given a battery, a bulb, and a piece of wire and told to see which group could be the first in getting the bulb to light. (SCIS-Model for Electric and Magnetic Interaction)

_____ 2. Children are asked to plot the orientation of a compass needle as it is moved around on a large sheet of newsprint which has a magnet placed in the middle. (SAPA, Part 6)

_____ 3. Children are asked to find the tracks of an animal in a photograph of a snowy wood scene. (ESS-Tracks)

See page 5 for Discussion of Task Focus.

Task Activity

Children are asked to locate objects in the room that have shapes like one of the three-dimensional shapes on the demonstration table. (SAPA, A-o)

1. What kind of action will the student be doing?

2. To whom will they need to be talking?

3. What materials will they need?

4. How much time will they need these materials?

5. How will they get these materials?

6. Which room arrangement would you use?

A	B	C	D
XX XX	X X X	XX XX	X X
XX XX			X X
	X X X	XX XX	X X
XX XX			X X
XX XX	X X X	XX XX	X X
			X X
	X X X	XX XX	X X X

7. What is your reason for that choice of arrangement?

Discussion of Your Answer

According to the activity, students will be moving around the room, identifying objects. They probably will be talking mostly with the teacher about the three-dimensional shapes the teacher has in a central location. In the activity the students will not have any materials at their desk since the only materials needed are on the demonstration table. Arrangement D would make it possible for all children to have an equal opportunity to see the three-dimensional objects on the table.

Let's try another one.

With mystery boxes, children are using a circuit tester to identify the hidden wire patterns between connectors on the box lid. (SCIS-Model of Electrical and Magnetic Interaction)

1. What kind of action will the students be doing?

2. To whom will they need to be talking?

3. What materials will they need?

4. How much time will they need with these materials?

5. How will they get these materials?

6. Which room arrangement would you use?

```
      A                 B                    C                D

XX  XX            X  X  X              XX  XX           X       X
XX  XX                                                  X       X
                  X  X  X              XX  XX           X       X
XX  XX                                                  X       X
XX  XX            X  X  X              XX  XX           X       X
                                                          X   X
                  X  X  X              XX  XX              X X X
```

7. What is your reason for the choice of that arrangement?

Discussion of Your Answer

In this activity a group of students (2-4) will be testing their ideas about hidden wire patterns. They need to talk with each other in their group. They will need both mystery boxes and a circuit tester during the entire lesson. Room arrangement A would probably be the best one to encourage children to share ideas with each other and use the same equipment.

Describe an activity in any subject area that you desire.

For this activity,

1. What kind of action will the student be doing?

2. To whom will they need to be talking?

3. What materials will they need?

4. How much time will they need these materials?

5. How will they get these materials?

6. What room arrangement would you use?

```
     A                  B                   C                 D

XX  XX             X  X  X             XX  XX            X        X
XX  XX                                                   X        X
                   X  X  X             XX  XX            X        X
XX  XX                                                   X        X
XX  XX             X  X  X             XX  XX            X        X
                                                          X      X
                   X  X  X             XX  XX              X X X
```

7. What is your reason for the choice of that arrangement?

Discussion of Your Answer

If you feel uncertain about either your choice of arrangement or the reason for it, please talk with your instructor.

You are now ready for the Competency Appraisal. Please have it scored by the instructor when you are finished.

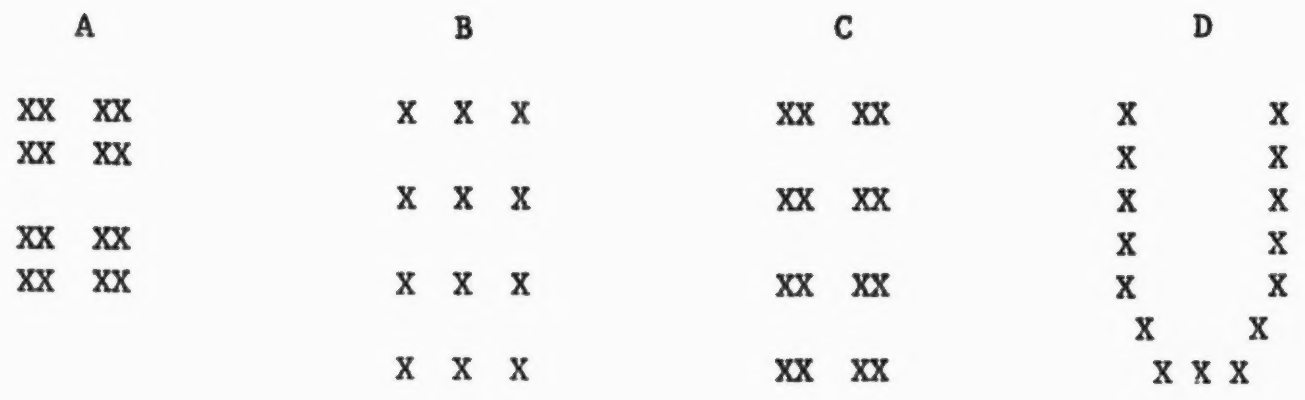
Discussion of Task Focus

In the activities in #1, it is very important that each child be involved. The materials needed are probably simple and inexpensive enough that you could have a set for each two children, hence diagram "C".

The space needed for #2 as well as the need for personal involvement in the activity suggests that "A" would be the best arrangement.

Photographs are really quite inexpensive, and individual children action is needed in #3. Any arrangement would be satisfactory.

COMPETENCY APPRAISAL



Groups of 4 students

Individual students in rows

Pairs of students

U-shaped arrangement

Above are four room arrangements. Place the letter of the arrangement which best fits each instructional activity.

_____ As one child drops the ball, its bounce height is marked and a chart is prepared showing the data collected from dropping the ball at various heights.

_____ The teacher directs the class in preparing a graph from the charts they have produced.

_____ One child demonstrates while the rest of the class watches him drop a handball to determine how high it would bounce.

INSTRUCTIONAL DESIGN TASK # 19

Task Objective

Identify an appropriate time management plan for an instructional sequence.

Task Focus

Your science class has 30-minute daily periods. You plan to begin this lesson on a Wednesday. Circle the time period that would be your best estimate for teaching each of the following activities:

Title: Dscribing the Motion of a Bouncing Ball (SAPA, D-c)

	Minutes		
Pre-Appraisal			
Ask the children to use a bar graph to predict the bounce height of a ball when it is dropped from intermediate points. Drop the ball from the heights the children suggest so that the test can verify their predictions.	15	30	60
Acitivity 1			
Drop a sponge ball on the floor and catch it as it bounces back. As the children to describe what they have observed. They should describe the ball in straight-line motion toward the floor and back; the blurred appearance of the ball when in motion; and the sound when it bounces. Ask: Did the height from which the ball dropped affect the number of bounces you count?	15	30	60
Activity 2			
Divide the class into groups of eight and give each group four different balls. As the group compares one ball at a time, exchange balls so that eventually each child will have a record of the number of bounces each ball makes when it is dropped.	15	30	60

Minutes

Activity 3

15 30 60

Divide the class into groups of three or four children. At some time during the day have each group go to one of the stations. Each group should be equipped with two or three balls as well as paper and pencil for recording purposes. Tell them to take turns dropping the balls from the sixth, fourth, and second lines and to record the bounce heights.

Activity 4

15 30 60

Distribute graph paper to the class and ask them to graph their own results. Have them mark their predictions lightly on the graph and return to the same stations to test their predictions with the same kind of balls they used before. When they have done all this, discuss their results.

Post-Appraisal Activity

15 30 60

Make a wall chart and have pairs of children in turn drop a golf ball, measure the bounce height, and record the bounce height on the chalkboard. The first child should start with a drop height well above the scale. The exact drop height is unimportant as long as the bounce height falls on the scale. Have one child of the second pair drop the ball from the first bounce height while his partner observes the new bounce height. Repeat this procedure each time, having the child drop the ball from the preceding bounce height. Have the children make a bar graph of the data, record it on the chalkboard, and ask them to describe what happened. Some children may guess that his represents the bouncing ball when it is dropped and allowed to bounce freely.

See page 7 for Discussion of Task Focus.

Task Activity

Here's a science unit for fifth grade students. You have a 60 minute science period each day. Circle the time period that you think would probably be the best time for each activity.

Title: A Unit of Force (SAPA, E-s)

	Minutes		
Pre-Appraisal			
Discuss how you would measure the force it takes to get a spitball from the pitcher's mound to home plate.	30	60	90
Activity 1			
Give the students the materials to set up a tripod and have them assembe the apparatus so that they could use it to measure force.	30	60	90
Activity 2			
Display a container with a rubber band attached and two or three objects of different weights. Ask the children to compare the forces needed to lift them. They should be able to order the objects from lightest to heaviest; that is, from greatest force to smallest force. Ask them to compare the force necessary to stretch the rubber band 5 cm with the force required to stretch the rubber band 10 cm.	30	60	90
Activity 3			
Give the children both plain paper and graph paper and tell them you would like each of them to make a graph showing the increase in the length of the spring as different numbers of objects are attached to the bottom of it.	30	60	90
Activity 4			
Give each group of children a tripod, a spring mounted in a plastic tube with a centimeter scale or tape attached, graph paper, and two standard 1 newton weights Tell the children you want them to calibrate the springs attached to the tripod. They will need to devise some scheme for using the spring in order to measure forces in newtons.	30	60	90

Activity 5	Minutes		
Have the children measure the force of earth-pull on an object which you give them. Have the children measure the force required to stretch the rubber band 15 cm.	30	60	90
Post - Appraisal			
What would you do to measure the force it takes to move a box of marbles?	30	60	90

Discussion of Your Answer

Flexibility in time management and expectation of how long it will take is a key idea. In this case, an acceptable plan would be:

Pre-Appraisal	30 minutes
Activity 1	(They need to have 60 minutes in order to mess around and get acquainted with the apparatus.)
Activity 2	30 minutes
Activity 3	30 minutes
Activity 4	60-90 minutes (This task may prove to be quite a challenge.)
Activity 5	60 minutes
Post-Appraisal	30 minutes

Here is a set of activities for the first grade class where the children have 20 minute periods. Circle the time period that you think would probably be the best time to teach each of these activities:

Title: Observing Movement (SAPA, A-h)

Pre-Appraisal	Minutes		
Move a ball around and have the children tell you which direction you are moving it. Make it move in three different directions in a sequence and have them tell you this sequence.	10	20	30

Activity 1

Hold a paper streamer in front of a fan so that the streamers blow across the children's line of sight. Ask them what they can see happening to the paper streamer. Turn the fan off and ask them what they see happening to the paper streamer now 10 20 30

Activity 2

Give each child a paper streamer. Take a walk around the school and ask the children to look about to find whether they can observe anything else which is moving. Leaves may be blowing, tree branches may be moving, people may be walking, clouds may be visible and moving, etc. 10 20 30

Activity 3

Put a bowl with a fish in it in the room. Place the bowl so the children can see it easily. Have the children describe the motion of the fish. 10 20 30

Activity 4

Bring at least one additional animal to the classroom. A turtle might be good. Tell the children to observe it carefully and tell you when they see it move. Have them describe its motion. 10 20 30

Activity 5

Bring to class one of the crazy, wind-up toys which demonstrates movement in several directions. Set the toy operating and ask the children to observe all they can about its movements and tell you how it is moving. 10 20 30

Post-Appraisal

Stand in front of the class and point slowly first with one hand and then with the other from left to right and then up and down. Walk forward and backward and to your left and right. As you are doing this, have children describe what it is that you are doing. 10 20 30

Discussion of Your Answer

It would be suggested that the Pre-Appraisal will require 20 minutes.

Activity 1	10 minutes
Activity 2	10 minutes
Activity 3	20 minutes
Activity 4	20 minutes
Activity 5	20 minutes
Post-Appraisal	10 minutes

Select a topic of your own choice. Briefly outline the activities and then specify how much time it will take for each activity.

You are now ready for the Competency Appraisal. Please have the Instructor score this when you are finished.

Discussion of Task Focus

Estimating the time it will take for an activity in the classroom is not an easy task. However, it is quite essential for the efficient use of classroom time. The Pre-Appraisal and Activity 1 are of short duration and involve primarily teacher demonstration:

Pre-Appraisal	15 minutes
Activity 1	15 minutes
Activity 2	should be completed in 30 minutes; however, if your class is not accustomed to working in groups, an additional 30 minutes may be needed.
Activity 3	will certainly require 60 minutes.
Activity 4	requires constructing a graph. If your students are at ease with graph construction, this activity can be done in 30 minutes.

The test of the predictions should be completed in a second 30 minute period, making a total for Activity 4 of 60 minutes.

Post-Appraisal activities should be done in 30 minutes.

COMPETENCY APPRAISAL

Your science class has 30 minute daily periods and you plan to begin an exercise on Tuesday. Circle the time period you consider appropriate for the activities:

Activity	Minutes	
Pre-Appraisal		
Give each child a set of crayons (red, green, yellow, blue, orange, purple). Ask each child to point to his red crayon when you say red. Repeat for all six colors. Ask the children to name and point to the red, blue, and yellow crayons.	15	30
Activity I		
Put an assortment of red, yellow, blue slips of construction paper in a bag. Ask children to come up, a few at a time, and take a piece of paper from the bag, and place it in one of three paper plates (on the table) of matching color and name the color.	15	30
Activity II		
Place in view the 3 plates from Activity I. Put pieces of colored paper around the room (colors include red, blue, yellow and lighter tints as pink, light blue, turquoise, light red). Ask the children to look for the pieces of paper and put them on the plate of the color most like it.	15	30
Activity III		
Use the same 3 plates and slips of paper from Activity I, adding slips of orange, green, purple. Play the same game. If children are uncertain where a color slip belongs, tell them to put it between the 2 plates with colors most like it. They are almost certain to have questions about where to put orange, green and purple. Some may suggest the need for other plates. Introduce orange, green and purple plates and ask the children where the new plates belong. The children will probably decide that orange belongs between yellow and red, purple between red and blue, and green between blue and yellow. Ask them to put the orange, green, and purple papers on the appropriate plates.	15	30

	Minutes	
Activity IV		
From a collection of paper and fabric scraps of many hues, children in groups will produce a collage. Each group will make a collage of a particular color. Let them choose items most like red to make a red collage and paste those items on red construction paper. The children might bring from home other red materials (buttons, ribbons) to add to the group project.	15	30
Post-Appraisal		
Show the children three blocks--red, blue, yellow. Ask them to name the color of each block. Show three more blocks--orange, green, purple--and as you name the color, ask them to identify the block of that name.	15	30

INSTRUCTIONAL DESIGN TASK # 20

Task Objective

Construct an instructional plan.

Task Focus

Here is a lesson plan. Rate each part of this plan as:

a. adequate
b. needs clarification
c. inadequate

Relative Position
(SCIS - Relativity)

I. Objective. At the end of this activity, the child will be able to describe the position of objects or systems.

II. Pre-Appraisal. Begin by asking the class where various objects in the classroom are located. Where is the door? Where is the light switch? Where are you? The children may reply by describing its position relative to other objects, or by describing its position relative to themselves.

III. Activities. Play the game "Where is the Object?" and "Blindman Statue." Children will gain much experience in describing position of objects and identifying objects when position is described. In addition they enjoy game-type activities.

IV. Evaluation. When the activities are completed it is most essential that you find out how much each child has progressed. It is only in this way that you can decide what steps in science instruction should be planned next.

I	Objective	Rated	______________
II	Pre-Appraisal	Rated	______________
III	Activities	Rated	______________
IV	Evaluation	Rated	______________

See page 9 for Discussion of Task Focus.

Task Activity

As useful application of systematic lesson planning, the filmstrip and tape presentation "The Teaching of Reading" illustrates the use of your skills in another teaching area. You will need this answer sheet.

The Teaching of Reading
Answer Sheet

1. A B
2. A B C
3. YES NO
4. A B C
5. A B C
6. RULE ONE ____
7. YES NO
8. YES NO
9. A B
10. A B

11. A B

12. A B C

13. RULE ONE ____________________

14. RULE TWO ____________________

15. A B C

16. ____________________

17. ____________________

____

18. ____________________

19. RULE TWO ____________________

RULE THREE ____________________

20. RULE ONE ____________________

RULE TWO ____________________

RULE THREE ____________________

RULE FOUR ____________________

Let's try an application of your skills in another total task of lesson planning.

Here is a brief description of a lesson for second grade. Rate each part of this plan as:

- a. adequate
- b. needs clarification
- c. inadequate

The Shapes of Animals
SAPA, B-c)

I. Objective

A. At the end of this activity, the child will be able to describe common environmental objects, such as animals, in terms of two- and three-dimensional shapes.

B. At the end of this activity, the child will be able to identify and demonstrate bilateral symmetry in animals.

II. Pre-Appraisal

Give each child a partially complete sketch of an animal in which the basic outline shows parts of circles, triangles, and the like. After the children have identified the animal, ask them to complete their sketch. Show the children a picture of an animal which they have not discussed. Ask them to select three-dimensional shapes which they think parts of the animal may represent. Ask them to make a checkmark on their papers if they think the animal has bilateral symmetry.

III. Activities

Hold up some plane shapes and ask the children to name them. Include shapes like circle, ellipse, square, rectangle, and triangle. Then reverse the process and ask children to identify shapes when you name them. Show the class one of the animal pictures and ask the class to describe the animal. Hold a large model of an animal and ask the class to describe the animal. Hold a large model of an animal and ask what solid shapes are identifiable. Which hollow shape is the tail most like? OR Where on the animal do you see a shape like a cylinder. Give the child some modeling clay and ask them to make a model of the animal. Does this animal have symmetry? How could we describe the symmetry of animlas? Could the animal model be divided into two pieces of equal size and shape? Where would a plane of symmetry be placed?

IV. Evaluation

Show the child a sketch of a horse.

I. Objective Rate________

II. Pre-Appraisal Rate________

III. Activities Rate________

IV. Evaluation Rate________

Did you rate any part of this with a "b"? What was your reason for rating that part of the plan "B"?

Rewrite this part so that it could be rated "a".

Discussion of Your Answer

The evaluation section should be rated "b". It does not tell you what you would have the child do with the sketch of a horse in order to demonstrate the performance of the objective. An acceptable rewrite would be "Ask the child to outline the shapes he sees in the horse and to snow how he knows that the horse is symmetrical."

Let's try another. Here is a unit which is suitable for middle grades.

Will Seeds Grow in the Dark?
(ESS - Starting from Seeds)

I. Objective. At the end of this activity, the child will be able to enjoy discovery and investigation with seeds.

Have each child take a dozen or so seeds. In trial classes, children have begun growing just one type of seed at first and then later started growing other kinds. Some children will probably want to bring seeds from home. If you have space for more containers, this can be very valuable, as the children will have more types of plants to compare. Can they tell which types of plants came from the same types of seed? As children plant the seeds, questions arise. How deep do you plant them? Is this enough water? If you restrain yourself from giving answers to these questions, some of the children may be led toward further experiments. Do deeply sown seeds grow better than seeds which are planted close to the surface? How little water will allow the seeds to sprout? Will the seeds sprout underwater? Encourage children who are interested to explore these side questions. Similar opportunities for independent investigations will arise thorughout the unit.

Rate the following parts of this plan as:

a. adequate
b. needs clarification
c. inadequate

I. Objective Rated______________
II. Pre-Appraisal Rated______________
III. Activities Rated______________
IV. Evaluation Rated______________

Did you rate any of these items "c"? If so, for what reason?

Rewrite that part so that it would be rated adequate.

Did you rate any part of this task "b"? If so, for what reason?

Rewrite that part so that it could be rated adequate.

Discussion of Your Answer

If you experienced difficulty in rating this plan, take heart. First, in order for you to judge the adequacy of activities and appraisals, you must clearly specify objectives. The objective "to enjoy discovery and investigation with seeds," does not describe observable student behavior. On the other hand, the activity describes a series of creative and really fun explorations. To give these explorations a focus, let's try this:

At the end of this experience, the child should be able to describe changes in seeds when they are planted under different conditions.

Here is a topic in social studies and its objective. Describe what you would do for the first two days.

Topic: Using Maps

Objectives:

At the end of the activity, the child will be able to:

1. Identify and name distances on a map given a key.
2. Identify and name locations on a map given a key.
3. Construct a map on a larger or smaller scale than the area or object the map represents.

(SAPA, D-j)

Discussion of Your Answer

Look back at the activity which you described. Did you provide an opportunity on the first day to involve children in experiences so that you could tell how well they could perform the objectives?

A second question to ask yourself is how well do the activities fit the behaviors described in the objectives?

You are now ready for the Competency Appraisal. Please have it scored by the Instructor as soon as you are finished.

Discussion of Task Focus

An adequate objective is one that specifies what action or behavior the students will be expected to be able to do by the end of the instruction. As stated here, the objective should be rated "a".

An adequate Pre-Appraisal should describe what specifically would be said or done to involve the student in a situation in which he would have an opportunity to demonstrate the behavior described in the objective. As stated in II, it should be rated "a".

Instructional activities should briefly describe both the situation and the lead-in or involvement question with the teacher. The situations are described in III (if you know the details of the two-games mentioned), but involvement tasks are missing. This should be rated either "b" or "c".

Evaluation should be as specific as the Pre-Appraisal. As stated here, it is totally inadequate and should be rated "c".

COMPETENCY APPRAISAL

Here is a lesson plan. Rate each part as

a = adequate
b = needs clarification
c = inadequate

PLAN A

Part of Plan	Rating
I. Objective Distinguish one sound as being louder than or softer than, longer than or shorter than, and higher than or lower than, another sound.	
II. Pre-Appraisal Ask the children to be very quiet, and to see whether they can hear their neighbor breathing. Then ask what they could do to hear better.	
III. Activity Ask the children to be quiet and listen while you make two sounds. First drop a book on the table from a height of 10 cm. Then drop it on the floor from a height of 1 meter.	
IV. Evaluation Use a tonette instrument and blow a note softly then blow the same note loudly. Ask how the notes differed. Repeat by blowing a note for three seconds, then blow the same note for one second. Ask the difference. Now, blow a note, then blow a second note about 3 notes lower and ask the difference in these two.	

PLAN B

Part of Plan	Rating
I. Objective Distinguish between objects that have an odor and those that do not.	
II. Pre-Appraisal Show the children 2 clear bottles that appear to be empty and look very much alike. Say that you know a difference between these bottles, and ask if they can find out what the difference is.	
III. Activity Give each child a piece of blue cloth. Ask them to describe it in as many ways as they can--shape, size, color, texture, etc. Now give each child a red cloth of same size, shape, etc. as the blue, but containing perfume. Ask them to describe the red piece of cloth and how it differs from the blue.	
IV. Post Appraisal Prepare four bottles containing clear tap water colored blue, white vinegar, white vinegar colored red, and vanilla extract. Give the child the bottles and ask him to put them in 2 groups--those that have an odor and those which do not.	

INSTRUCTIONAL DESIGN TASK # 21

Task Objective

Describe questions or verbal tasks the teacher might use which are consistent with the objectives.

Task Focus

Based on these objectives,

> 1. At the end of this activity the child will be able to identify and name common two-dimensional shapes.
> 2. At the end of this activity the child will be able to identify common two-dimensional shapes and objects in the environment.
>
> (SAPA, A-b)

a teacher planned several activities. Rate these activities as

a. not related to objectives.
b. teacher dominates the action by limiting the possibilities of response to 1 or 2 answers.
c. student dominates the action because of an open-question or task.

_____ 1. The teacher demonstrates how to use two nails and a string to make an ellipse.

_____ 2. The teacher points to a ball and asks what is the name of its shape.

_____ 3. The teacher asks children to make a shape with clay and then tell her what it is.

_____ 4. The teacher asks children to find something that is shaped like a square.

See page 4 for Discussion of Task Focus.

Let's try this one.

Based on this objective,

> At the end of this activity the child will be able to describe orally a living or non-living object according to several of its characteristics. (SAPA, C-a)

a teacher's plan had these activities included. Rate them as:

a. not related to the objective
b. teacher dominates the action by limiting the possibilities of response to 1 or 2 answers
c. student dominates the action because of an open question or task

_____ 1. Tell me the difference between a turtle and a sea shell.

_____ 2. Tell me what you observed while watching the butterflies in the cage.

_____ 3. Is the direction the larvae moves forward or backward?

_____ 4. Give each child a dish with an earth worm and ask him to tell you how many segments he can count.

Did you rate any of these activities with a "b"? What was your reason?

Rewrite it so that it could be rated a "c".

Discussion of Your Answer

You should have rated # 1 and # 2 a "c". Both of these situations allow students to successfully respond in many different ways; however, # 3 and # 4 are rated "b" in that students can be successful only with one specific answer. A reword of # 3 so that it could be rated "c" is "watch the larvae and tell me how it moves." The child could describe how it used its legs to move, what direction it moved, how the surface affected its moving, or many other things he could observe about the motion.

State an objective for a lesson that you have taught.

Objective:____

____

Now list an activity which you would rate "a".

____

____

Describe an activity related to this objective which you would rate "b".

____

____

Now write down an activity related to this objective which you would rate "c".

____

____

Discussion of Your Answer

An activity which should be rated "a" is one in which both the teacher and students see no relationship between the activities and the objectives. A second characteristic of an "a" activity is that it does not provide an opportunity for students to display the behavior described in the objective. Your activity which is rated "b" should provide students with an opportunity to display the behavior in a very limited sense. It should be a kind of activity in which you ask a true-false type of question, for example. On the other hand, a "c" activity is one in which you pose a task and then allow students much freedom with what they say or do in that task.

You are now ready for the Competency Appraisal. Please have it scored by the Instructor when you have finished.

Discussion of Task Focus

Instructional activities should be selected and structured so that they will help the student achieve the objective. In this case, #1 does not fit this category and should be rated "a".

Sometimes an activity can be quire structured by the students, that is, children will know what to do without any verbal direction from the teacher. In other cases, some verbal help is needed, but the major responsibility for action is on the child. This kind of situation can be coded "c". Numbers 3 and 4 should probably be coded "c". In other situations, the teacher leaves little action for the child . A single-word answer or very short answer is all that is required. This is illustrated in # 2 and should be coded "b". .

COMPETENCY APPRAISAL

Based on the following objective, a teacher planned several activities. Rate the activities as:

a = not related to objective.
b = teacher dominates or controls the action by limiting the possibilities of response to 1 or 2 answers.
c = student dominates or controls the action because of an open question or task.

Objective: At the end of the activity the child will be able to CONSTRUCT an inference about conductors and nonconductors.

_____ A learning-type bulletin board gave children the opportunity to use suggested sources to answer questions they had about conductors.

_____ The teacher suggested that the children's mothers had used a padded glove for picking up hot pans because the cotton was a poor conductor.

_____ The children were asked to watch the teacher as she heated the end of a wire (1/2 meter in length) which passed through 6 wax balls spaced equi-distant across the wire.

_____ The children asked if they could do the wax ball-wire experiment and time the reaction of the wax balls.

_____ The teacher asked a group of children to take their wax-ball experiment to the office and show the principal what the class was doing.

INSTRUCTIONAL DESIGN TASK # 22

Task Objective

Identify and describe possible children's responses for teacher questions or verbal tasks.

Task Focus

Here is an objective and a description of a classroom activity.

Objective:

At the end of this activity the child will be able to identify the variables that are manipulated in an investigation of the movement upward of liquids and materials. (SAPA, E-c)

Activity:

Just before the science period, make the following preparations that the children should not see. Drip a strip of yellow blotting paper about 40 cm long and 5 cm wide in a shallow dish of water and keep it there until the wet part of the strip is substantially longer than the water is deep. Show the children the partially wet strip and the dish of water. Tell them that you did not throw the water on the paper and ask, How do you think the paper got wet?

Write two acceptable student responses:

1.

2.

Write two unacceptable student responses:

1.

2.

See page 5 for Discussion of Task Focus.

Here is another situation:

What happened to the Daphnia population in the aquarium?
(SCIS - Population)

Objectives: At the end of this activity the child will be able to:

Recognize the problem.
Suggest solutions to a problem.
Devise and carry out experiments to test the proposed solution.
Think about experiments in relation to the information desired.

Activities:

After the children have noticed the sharp decline in the Daphnia populations in three aquaria in contrast to the more flourishing populations in the other three aquaria, listen for questions about the Daphnia decline. If none of the children raise questions of what caused the Daphnia population to decline or disappear, you should do so.

Write two acceptable responses.

1.

2.

Write two unacceptable responses

1.

2.

Discussion of Your Answer

Acceptable responses in this situation would be those in which children ask questions specifically about why there are fewer dophnia. Such questions might be: "Is the water making the dophnia sick?" "Is it too hot for the dophnia?" Unacceptable responses are one which ignore the task of the decline of dophnia; for example, "How do dophnia swim?" or "Can I catch a dophnia with a spoon?"

Handling the responses that a child makes is a real problem. List the unacceptable responses that you have written thus far in this task. (That is, the two in the task focus and the two on page 2.)

1.

2.

3.

4.

Now write down three other unacceptable responses that you have received when teaching.

5.

6.

7.

On the attached sheet you will find a list of ideas teachers have found useful in handling unacceptable responses from children.

Which ones of these ideas could you use with each of the seven unacceptable responses which you have described.

For unacceptable response #1, I would use Key Teacher Idea #___________.

For unacceptable response #2, I would use Key Teacher Idea #___________.

For unacceptable response #3, I would use Key Teacher Idea #___________.

For unacceptable response #4, I would use Key Teacher Idea #___________.

For unacceptable response #5, I would use Key Teacher Idea #___________.

For unacceptable response #6, I would use Key Teacher Idea #___________.

For unacceptable response #7, I would use Key Teacher Idea #___________.

KEY TEACHER IDEAS

I. THE STUDENT'S EXPERIENCES IN THE CLASSROOM

1. Do you let the student decide for himself rather than give him the criterion to look for?

2. Do you encourage the child to try out his suggestions rather than serve as the source of knowledge?

3. Do you let the child generate the basis of action rather than serve as the source of knowledge?

4. Do you take time to let the child grope, ponder, or mess around rather than direct him immediately to the conclusion?

5. Do you keep the children actively involved (either physically or mentally) rather than do the activity yourself?

6. Do you direct students in experiences prior to expecting analysis and meaning for words rather than presenting the vocabulary before the experience?

II. HOW THE STUDENT INTERPRETS HIS EXPERIENCES IN THE CLASSROOM

1. Do you respond to explanations with questions such as "how do you know" or "is it reasonable" rather than agree or disagree with the explanation?

2. Do you listen to student descriptions and push them for more precision rather than accept their first response.

3. Do you help students to question explanations in terms of reasonableness of their own experience rather than accept the reasonableness of your experience?

4. Do you recognize that one experience does not mean comprehension rather than assume because the point is clear to one, it is clear to all?

5. Do you select illustrations of an idea that progressively are less obvious than simpler ones rather than assuming that because the student saw the point in the simple illustration he sees it in all instances?

6. Do you make students back up and simplify complex statements so that other students comprehend rather than accept it because it sounds good or adequate to you?

III. TEACHER RESPONSES TO STUDENTS

1. Do you keep an open mind as to the student's response rather than accept only that answer you think is correct?

2. Do you direct student thinking by introducing situations that "don't fit" or that may be surprising rather than telling them that they don't see the point?

3. Do you adjust the pace of the exercise to the progress of the student rather than speed to cover it or drag to fill in the time?

4. Do you base your opinion of student performance on what you see him do rather than on what you assume he can do?

5. Do you pose questions to get students to think rather than to get the answer you think is correct?

6. Do you direct questions to the students level rather than expect all students to operate at the same level of experience necessary to answer a question?

7. Do you prove the basis for an inappropriate response rather than tell the student he is wrong and the search for the desired response?

**DO YOU CONTINUALLY INVOLVE THE GROUP IN THE ACTIVITY BY PROVIDING OPPORTUNITY FOR THEM TO EXPRESS AN OPINION BEFORE DOING AN ACTIVITY RATHER THAN LET THE ACTIVITY BE A DEMONSTRATION MONOLOGUE BETWEEN THE TEACHER AND ONE OR TWO STUDENTS.

Translating the unacceptable responses into a learning experience is a part of the challenge of being a teacher.

You are now ready for the Competency Appraisal. Please have it scored by the Instructor when you have finished.

Discussion of Task Focus

The acceptable responses would be those that name specific variables which logically could be causes for the paper to get wet.

Unacceptable responses are those which are not related to the situation but many times either attribute human characteristics to objects (i.e., it likes to get wet) or are attention-getting devices that the child is using.

COMPETENCY APPRAISAL

Here is an objective and description of a classroom activity:

Objective:	At the end of this activity the child will be able to identify which sense or senses are used to make observations.
Activity:	As children's rest period is ending, someone behind a screen begins popping corn. Ask this question, "How do you know what is happening?"

Write 2 acceptable student responses:

And write 2 unacceptable student responses: